April 8, 2019

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Docket ID No. EPA-HQ-SFUND-1999-0010

Attn: Jesse Avilés
Remedial Project Manager
U.S. EPA, Region 8
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Dear Mr. Avilés,

Earthjustice, on behalf of City Park Friends and Neighbors, Colorado Latino Forum, Cross Community Coalition, Elyria and Swansea Neighborhood Association, Unite North Metro Denver, Sierra Club, the undersigned members of the Vasquez Boulevard/I-70 Community Advisory Group ("CAG") in their individual capacities, and several individuals, (collectively, "Community Groups"), submits the following comments on the U.S. Environmental Protection Agency's ("EPA") proposed intent to delete Operable Unit 1 ("OU1") of the Vasquez Boulevard and I-70 Superfund Site ("VB/I-70") from the National Priorities List ("NPL").[1]

During the two decades since EPA began investigating the alarmingly high lead and arsenic concentrations in north Denver's residential soils, the agency has never determined the cause of that contamination. EPA has also systematically avoided meaningful sampling and investigation of subsurface soil contamination, focusing instead on the top two inches of soil. But evidence presented in the Expert Report of Mr. Charles Norris, including soil sampling by other agencies, indicates that a likely source of the contamination is upward migration of fill materials that were extensively used in north Denver (including, but not limited to, smelter wastes). As a result, EPA's remediation activities to date likely do not adequately address the sources of the lead and arsenic contamination in north Denver's soils. And because the cause has not been determined, let alone remediated, the contamination that EPA has deemed unsafe for human health is likely to re-occur as contaminants continue to migrate upwards.

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[1] These Comments are timely submitted on April 8, 2019. EPA proposed to delete OU1 from the NPL on February 6, 2019. 84 Fed. Reg. 2116, 2117 (Feb. 6, 2019) ("Proposed Rule"). Public comments were originally due on March 8, 2019. *See id.* EPA later extended the comment period by 30 days, until April 8, 2019. Memo. from Jesse Avilés & Betsy Smidinger re: *Posting EPA-HQ-SFUND-1999-0010 to Regulations.gov for Public Access* (Feb. 13, 2019) (Exhibit 1). Due to their voluminous size, all exhibits to these commits have been submitted on a flash drive by hand delivery to EPA Region 8 Headquarters. A full list of exhibits can be found on the final page of these comments.

EPA has therefore not met the three criteria for delisting OU1 from the NPL. Because EPA has not identified the cause of the lead and arsenic contamination in OU1, it cannot determine whether it has "implemented all appropriate response actions." Therefore, "further response action[s] . . . are appropriate," namely, subsurface soil sampling to investigate potential upward migration of contaminants, and, if necessary, remediating that contamination. Until EPA has determined that the contamination it found to be unsafe for public health is not going to recur, it cannot say that "no significant threat to public health or the environment" remains.

Because EPA has not fulfilled the criteria for delisting OU1 from the NPL, it should not finalize the proposed delisting. However, even if EPA does delist OU1, its ability, and obligation, to remediate unhealthy lead and arsenic contamination in OU1's soils will still exist. The applicable statute, regulations, and guidance all make clear that removing a site from the NPL does not preclude an agency from continuing to carry out necessary response actions, or adding the site back to the NPL. That is particularly true for partial delistings, such as this one, where other parts of the site remain on the NPL. Thus, in the alternative, if EPA does delist OU1, it should nevertheless conduct the necessary sampling and analysis of subsurface soils in north Denver. If that sampling program reveals lead, arsenic, or other contamination that poses a threat to public health, then EPA should immediately add a new Operable Unit 4 ("OU4") to the NPL to facilitate remediating that contamination

These Comments first provide factual background information about: (1) the Community Groups; (2) the north Denver neighborhoods where the VB/I-70 Site is located; and (3) EPA's investigation into the causes of soil contamination, and the remediation actions EPA has chosen to undertake. Next, these Comments explain the legal background about the standard for delisting sites from the NPL under 40 C.F.R. § 300.425(e). Third, the Comments explain why EPA's proposed deletion of OU1 does not meet the standard outlined in § 300.425 because: (1) EPA has not implemented all appropriate response actions; (2) Further response action by responsible parties is appropriate; and (3) EPA's Remedial Investigation does not show that there are no longer significant threats to public health or the environment. Fourth, these Comments explain why, if EPA chooses to finalize the proposed deletion (and even if it does not), it should create a new OU4 to identify and remediate the remaining sources of lead, arsenic, and other soil contamination in north Denver. Finally, these comments explain why they are "significant" and constitute "significant new data," to which EPA is obligated to respond.

I. Factual Background

This section first provides information about each undersigned organization and individual. It then provides background about the north Denver neighborhoods, to explain why the environmental justice implications of EPA's proposed delisting warrant extra care and scrutiny of the agency's decision. Next, the Community Groups summarize EPA's investigation into the causes of OU1's soil contamination and the agency's plan for remediating OU1.

A. Community Groups

City Park Friends and Neighbors ("CPFAN") is a Denver Registered Neighborhood Organization ("RNO"). Founded in 2012, CPFAN has 515 members. CPFAN's mission is to

actively protect the classical pastoral character of City Park, located in Denver, Colorado. CPFAN's northern boundaries are adjacent to the VB/I-70 Superfund Site, and its members are impacted by conditions in and around the Site. CPFAN Board Member Eileen (Bridget) Walsh is a member of the CAG.

The Colorado Latino Forum ("CLF") is dedicated to increasing the political, social, educational, and economic strength of Latinas and Latinos.

Cross Community Coalition ("CCC") is a registered neighborhood organization ("RNO") that the City and County of Denver recognized in 2015. It represents the entire community in the area bordered by Colorado Boulevard to the east, the Denver/Adams County line to the north, the South Platte River to the west, and 38th Street and 40th Avenue to the south. CCC is a grassroots organization that seeks to assist, serve, and represent the neighbors in this community. CCC is honored to take up the mantle of a previous iteration of CCC, which was a neighborhood services organization that advocated for and served north Denver residents for decades. Cross Community Coalition member Candi CdeBaca is a member of the CAG.

Elyria-Swansea Neighborhood Association ("ESNA") is an RNO with the City and County of Denver. ESNA represents residents and small business owners within the Elyria and Swansea neighborhoods. ESNA's mission is to educate and inform the community and facilitate informed discussion of the many unique issues and challenges facing the neighborhoods. ESNA provides grass-roots access for residents and property owners to dialogues formulating and implementing the common future they all share. That mission includes public meetings and outreach, advocacy for the neighborhoods' common interests and goals to civic leaders, as well as specific projects that provide tangible benefits for the community. The future in Elyria and Swansea is threatened at all levels: many large, outside forces are acting on these neighborhoods. ESNA is an advocate for the interests of its residents, and a bulwark against outside interests interfering with the cohesion of these affected communities. ESNA President Drew Dutcher is a member of the CAG.

Sierra Club is a not-for-profit corporation. Sierra Club's mission is to explore, enjoy, and protect the wild places of the earth; to practice and promote the responsible use of the earth's ecosystems and resources; to educate and enlist humanity to protect and restore the quality of the natural and human environment; and to use all lawful means to carry out these objectives. In addition to helping people from all backgrounds explore nature and our outdoor heritage, Sierra Club works to promote clean energy, safeguard the health of our communities, protect wildlife, and preserve our remaining wild places through grassroots activism, public education, lobbying, and legal action. Sierra Club has over 100,000 members and online supporters in Colorado. Lloyd Burton, the Sierra Club Colorado Chapter's Environmental Justice and Social Equity Issue Team Leader, is a member of the CAG.

Unite North Metro Denver ("UNMD") is an RNO established to truly unite the northern part of Denver to address those concerns that impact the city from Sheridan to Colorado Boulevard, 38th Avenue to the city limits on the North. UNMD Vice President Fran Aguirre is a member of the CAG.

In early 2016 several Denver residents met with EPA, Colorado Department of Public Health and Environment ("CDPHE") and Denver Department of Public Health and Environment representatives and requested to form a Community Advisory Group ("CAG"). In late 2016, EPA agreed to start discussions about creating a CAG. The CAG first met in March 2017 and has met monthly since then. The CAG's purpose is to provide a public forum for representatives of diverse interests to present their needs and concerns regarding cleanup activities at the VB/I-70 Superfund Site. The CAG provides a mechanism for all interested and affected parties in the community and environs to have a voice and actively participate in the Superfund process. The VB/I-70 CAG advocates for and advances implementation of optimum environmental cleanup standards and monitoring, even in excess of required EPA standards. Meetings included presentations from agency representatives, site contractors, non-governmental subject matter experts, discussion on topics related to Superfund site activities and the passing of 5 resolutions. The CAG has also sent letters, without response, to EPA Region VIII Administrator Doug Benevento. In August 2018, the CAG unanimously passed Resolution 2018-01, recommending that EPA halt the OU1 delisting process.[2] Due to the burden of the number of City and community meetings taking place at this time, in addition to family obligations and EPA's quarterly update occurring at the same time as the CAG's regularly scheduled March 2019 meeting, the CAG has not been able to assemble to formally vote on whether to sign on to these comments as an entity. Thus, rather than the CAG as an entity signing this comment letter, the following individual CAG members are signatories to this comment letter in their individual capacities: Fran Aguirre, Lloyd Burton, Candi CdeBaca, Drew Dutcher, Rey G., Jorge Merida, Kimberly Morse, Christine O'Connor, Armando Payan, and Eileen (Bridget) Walsh,

Finally, several individual residents of the neighborhoods where OU1 is located, and/or individuals who have attended and been involved with the CAG and other organizational meetings concerning the VB/I-70 Superfund Site sign these Comments in their individual capacities: Erika Delzell, Janet Feder, and Michele Swenson.

B. Background on North Denver Neighborhoods.

The VB/I-70 Site is located in north Denver's Globeville, Elyria, and Swansea (collectively "GES"), Cole, Clayton, and Curtis Park neighborhoods. Each of these neighborhoods has a rich cultural history—and a long legacy of environmental contamination. GES has long been home to a large immigrant population, and today its residents are predominantly Latino and low-income. Cole, Clayton, and Curtis Park are historically African-American neighborhoods, and despite changing demographics, still have high percentages of African-American and Latino residents today. All these neighborhoods, and especially GES, have a high concentration of polluting industries—a textbook case of environmental injustice. Indeed, EPA has repeatedly recognized that VB/I-70 is an "environmental justice site" because "the community is predominantly low income and minority and is disproportionately affected by

[2] VB-I/70 Superfund Site Cmty. Advisory Group, *Resolution 2018-01* (Aug. 2018) (Exhibit 35).

environmental impacts from many sources including industry, other Superfund sites, and the major transportation corridors Interstate 25 and Interstate 70."[3]

1. Dirty Smelters Polluted North Denver for Over a Century.

For well over a century, industrial activities have coexisted with residential land uses in north Denver, which has left a legacy of pollution. Some of the highest-profile industrial sources were smelters, though they are certainly not the only sources of pollution in north Denver. The Argo smelter was the first in the area, in what is now the west side of Globeville, in 1878.[4] It was followed by the Holden Smelter (which became the Asarco Globe plant), in 1886.[5] Symbolizing the smelting industry's power and status, when the Omaha-Grant Smelter, just southeast of the Platte River, expanded its operation in Globeville in 1892, it built a smokestack that was the tallest in the world, at 350 feet.[6] Over time, that power declined. The Omaha-Grant Smelter closed in 1903 due to economic challenges and its poor working conditions forcing its labor force to strike.[7] These same factors reduced the Argo plant's productivity, and after a 1906 fire, it ceased operation.[8] However, the Asarco plant operated until 2006, when its parent company declared bankruptcy.[9]

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[3] Memorandum from Bonnie Lavelle, Remedial Project Manager, EPA Region VIII, to Max Dodson, Asst. Reg'l Adm'r, EPA Region VIII, re: *Request for a Non-Time Critical Removal Action at the Vasquez Boulevard/Interstate 70 Environmental Justice NPL Site, Denver County, Denver, Colorado* at 4 (Mar. 3, 2003) ("2003 Action Memo") (Exhibit 2); *see also* EPA Region VIII, *Record of Decision: Vasquez Boulevard/Interstate 70 Superfund Site: Operable Unit 1 Residential Soils* at 1 (Sept. 25, 2003) ("2003 ROD") (Exhibit 36) ("EPA determined that the VB/I-70 Site is an Environmental Justice (EJ) Site because the residents are predominantly low income and minority. It is also disproportionately affected by environmental impacts from many sources including Industry, other Superfund sites, and major transportation corridors.").

[4] Denver Post, *Gophertown Residents Live in the Abandoned Tunnels of Denver's Argo Smelter* (Aug. 17, 2012), http://blogs.denverpost.com/library/2012/08/17/gophertown/3340/ (Exhibit 4).

[5] Globeville Story, *Globe ASARCO* (May 23, 2011), http://globevillestory.blogspot.com/2011/05/globe-asarco.html (Exhibit 5).

[6] Randel Metz, Denver Library History, *World's Tallest Smokestack Comes Tumbling Down* (Aug. 14, 2014), https://history.denverlibrary.org/news/worlds-tallest-smokestack-comes-tumbling-down (Exhibit 6).

[7] Globeville Story, *The Omaha and Grant Smelter* (May 3, 2011), http://globevillestory.blogspot.com/2011/05/omaha-and-grant-smelter.html (Exhibit 7).

[8] Globeville Story, *The Heritage of Smelting* (Apr. 19, 2011), http://globevillestory.blogspot.com/2011/04/heritage-of-smelting.html (Exhibit 8).

[9] Cara DeGette, Ctr. for Health Journalism, *The Legacy of Pollution in One of Denver's Oldest Neighborhoods* (Feb. 19, 2003) https://www.centerforhealthjournalism.org/2013/02/19/legacy-pollution-one-denvers-oldest-neighborhoods-0 (Exhibit 9).

2. History of Globeville, Elyria, and Swansea

Elyria and Swansea were founded and platted in 1885 as two separate settlements near Denver's growing industries, including smelters.[10] Elyria and Swansea were consolidated into Denver in 1902, and are today considered part of the same "statistical neighborhood" even though many residents still consider them to be distinct.[11] Today, Elyria-Swansea remains a place where polluting industrial activities and residential areas coexist side by side.[12] As explained in the Elyria-Swansea Neighborhood Plan, "[a]lthough the smelters are now gone and the meat-packing industry is much-diminished, a strong industrial presence remains today, as does an established residential community with a significant supply of workforce housing."[13]

Elyria-Swansea's population is 84% Latino, one of the highest percent Latino populations of any neighborhood in Denver.[14] Compared to Denver as a whole, Elyria-Swansea are on average younger, poorer, less educated, and more likely to be: (1) monolingual Spanish speakers, and (2) live in a family with children.[15]

Like Elyria and Swansea, Globeville is a neighborhood where heavy industry and residences have always coexisted in close proximity. As explained in the Globeville Neighborhood Plan, "Globeville grew up in the industrial age, when houses were built adjacent to industry . . . Globeville's landscape is still representative of this industrial heritage, and there are many examples within the neighborhood where residential uses are located directly across a street or alley from industrial uses. The result is a harsh edge between stable industrial uses and stable residential uses."[16]

Globeville is also predominantly (68%) Latino and low-income.[17] According to a 2014 City of Denver report, citing 2012 Census Bureau Data, the household income in Globeville is $39,200, well below Denver's $73,100 average.[18]

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[10] Denver City Council, *Elyria and Swansea Neighborhoods Plans* at 14 (Feb. 23, 2015), https://www.denvergov.org/content/dam/denvergov/Portals/646/documents/planning/Plans/Elyria_Swansea_Neighborhood_Plan.pdf ("Elyria-Swansea Neighborhood Plan") (Exhibit 3).
[11] *Id.*; *see also id.* at 15 (map showing division between Elyria and Swansea at York Street).
[12] *Id.* at 15.
[13] *Id.* at 1.
[14] Gretchen Armijo & Gene Hook, Denver Dep't of Envt'l Health, *How Neighborhood Planning Affects Health in Globeville & Elyria Swansea* at 14 (Sept. 2014), https://www.denvergov.org/content/dam/denvergov/Portals/746/documents/HIA/HIA%20Composite%20Report_9-18-14.pdf ("HIA") (Exhibit 10).
[15] *Id.* at 14.
[16] Denver City Council, *Globeville Neighborhood Plan* at 19 (Dec. 1, 2014), https://www.denvergov.org/content/dam/denvergov/Portals/646/documents/planning/Plans/Globeville_Neighborhood_Plan.pdf ("Globeville Neighborhood Plan") (Exhibit 11).
[17] HIA at 14.
[18] *Id.*

3. History of Curtis Park, Clayton, and Cole

Curtis Park is Denver's oldest residential neighborhood, established in the 1860s. It quickly became crowded with a mix of residents and housing types, until many of its wealthier residents began leaving for more exclusive areas. By the 1920s, most of the larger residences had been divided into smaller units, and the residents were mostly African-American. The neighborhood remained predominantly African-American for decades to come, due in no small part to racist housing policies and discriminatory real estate practices that prevented African-American families from moving into or buying property in many other areas.[19] Curtis Park has also historically been home to a large Latino population, which began increasing during the 1940s. Today, Curtis Park is approximately 47% white, 18% Black, and 18% Hispanic. This reflects the city-center trend towards gentrification. Housing values and prices are now slightly above Denver's average, a dramatic change from ten years ago.[20]

Clayton first developed in the 1880s and 1890s. It later experienced a growth spurt of new affordable housing units after World War II.[21] Today, Clayton's population is approximately 46% Hispanic and 23% African-American. Clayton's 2016 median household income was $48,000, well below Denver's city-wide average.[22]

Cole was built mostly in the 1910s and 1920s. Cole's African-American population began increasing in the 1940s, and by the late 1960s, the neighborhood was predominantly African-American.[23] As of 2016, it was approximately 50% Hispanic and 15% African-American.[24]

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[19] Caitlin Hendee, Denver Bus. J. & 9News, *9Neighborhoods: Historic Curtis Park is Vibrant, Diverse* (Nov. 25, 2016), https://www.bizjournals.com/denver/news/2016/11/25/dbj-9news-9neighborhoods-historic-curtis-park-is.html.

[20] Citydata.com, *Curtis Park Neighborhood in Denver, Colorado (CO), 80205, 80216 Detailed Profile* (last visited Apr. 5, 2019), http://www.city-data.com/neighborhood/Curtis-Park-Denver-CO.html ("Curtis Park Profile") (Exhibit 12).

[21] ClaytonDenver.org, *Clayton – A Denver Neighborhood* (last visited Apr. 5, 2019), https://claytondenver.org/ (Exhibit 13).

[22] Citydata.com, *Clayton Neighborhood in Denver, Colorado, 80205 Detailed Profile* (last visited Apr. 5, 2019), www.city-data.com/neighborhood/Clayton-Denver-CO.html (Exhibit 14).

[23] Living Places, *Cole Neighborhood Historic District* (last visited Apr. 5, 2019), www.livingplaces.com/CO/Denver_County/Denver_City/Cole_Neighborhood_Historic_District.html (Exhibit 15).

[24] Citydata.com, *Cole Neighborhood in Denver, Colorado (CO), 80205 Detailed Profile* (last visited Apr. 5, 2019), http://www.city-data.com/neighborhood/Cole-Denver-CO.html (Exhibit 16).

4. North Denver's Predominantly Minority and Low Income Residents Bear Disproportionate Pollution and Health Burdens not Only from Legacy Smelter Pollution, but also numerous other sources.

North Denver residents face more negative environmental impacts and have access to fewer public amenities than residents in more affluent Denver neighborhoods. As the Denver Post reported, "[n]o other populated area in the country carries as high an environmental risk as a few square miles" surrounding the VB/I-70 Superfund site.[25] The Denver Post article was describing a 2017 study that identified zip code 80216, which covers most of the VB/I-70 Superfund site, as the most polluted in the nation.[26] The report, developed by ATTOM Data Solutions, analyzed a nationwide property and real estate database of 8,642 U.S. zip codes with available housing data, focusing on: (1) air quality; (2) Superfund sites; (3) polluting sources listed in EPA's Toxic Release Inventory ("TRI"); and (4) brownfields and former drug labs.[27] ATTOM ranked each of the four criteria on a 1 to 250 scale, then combined scores in all four indices for an aggregate score. 80216 scored 455 in ATTOM's index.[28] The next highest score, zip code 92408 in San Bernardino, California, was 400.[29]

Soil contamination is one of the primary impacts that north Denver residents must contend with—uncertainty about whether it is safe to grow vegetable gardens, dig or play in the soil, or conduct home improvement activities that involve soil displacement. Additionally, lead poisoning rates are higher in north Denver communities than elsewhere.[30] And research shows that Elyria-Swansea has one of the highest rates of asthma, cancer, cardiovascular disease, diabetes, and obesity in Denver.[31] Specifically, a 2014 City of Denver Health Impact Assessment found that "northern and western Denver neighborhoods have higher emergency room rates for youth asthma-related events than others, with higher than average rates observed around the I-70 corridor and the junction of I-70 and I-25."[32] The annual rate of asthma-related emergency room visits by children is 38% greater than Denver as a whole (39.6/1,000 Elyria-Swansea residents, compared to 28.5/1,000).[33] A 2003 study found higher than expected rates of several cancers in GES.[34] Residents of Denver City Council District 9, where GES are located,

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[25] Aldo Svaldi, *Northeast Denver Neighborhood Is Nationa's Most Polluted*, Denver Post (Feb. 16, 2017), https://www.denverpost.com/2017/02/16/denver-most-polluted-zip-code/ (Exhibit 17).

[26] RealtyTrac, *17.3 Million U.S. Homes with Combined Value of $4.9 Trillion in Zip Codes with High Environmental Hazard Risk* (Feb. 16, 2017), http://www.realtytrac.com/news/home-prices-and-sales/2016-environmental-hazard-housing-risk-index/ (Exhibit 18).

[27] *Id.*

[28] *Id.*

[29] *Id.*

[30] Burt Hubbard, The Colorado Trust, *In Denver's Older Neighborhoods, Kids Show Signs of Exposure to Lead* (Dec. 6, 2016), https://www.coloradotrust.org/content/story/denvers-older-neighborhoods-kids-show-signs-exposure-lead (Exhibit 19).

[31] HIA at 16–17.

[32] *Id.* at 16.

[33] *Id.*

[34] *Id.* at 17.

experience a 42% higher cardiovascular disease death rate than southwest Denver's District 2 (213/100,000 residents, compared to just above 150/100,000 residents).[35] Another recent study showed that the average life expectancy for a Globeville resident is 73 years; an Elyria-Swansea resident is 78; and a resident of Stapleton, a neighborhood just a few miles to the east, is 84.[36]

Despite these challenges, north Denver remains a place of vibrant community life, with many families that are proud to have called it home for generations. The Elyria-Swansea Neighborhood Plan explains that "[s]trong community cohesion and civic pride bolster the neighborhoods even when presented with issues that cause major challenges for quality of life."[37] The Globeville Neighborhood Plan states that "[m]any of Globeville's residents express pride in the relatively high rates of home ownership, which gives people a stake in the community" and describes Globeville as the "most culturally rich, diverse, and historic areas in the City of Denver."[38] Curtis Park, Clayton, and Cole share a similarly rich history, culture, community, and pride. Curtis Park is home to the Black American West Museum and new and old residents and visitors alike to embrace the neighborhoods rich and unique history.[39]

C. History of the VB/I-70 Superfund Site, EPA's Scientific Investigations, and Remediation Actions.

Over the course of more than two decades, EPA has been investigating the causes of, and working to remediate, lead and arsenic contamination in north Denver's residential soils. But throughout this time period, EPA has never conclusively determined the cause of that contamination. EPA's inability to do so likely reflects its myopic focus on the top two inches of soil, and repeated refusal to conduct deep (below 12 inches) subsurface soil sampling. Though EPA has now (mostly) carried out the remediation plan it developed in 2003, that plan was based on incomplete information. Thus, the remediation activities EPA has completed to date may not actually address the health risks posed by lead and arsenic contamination in north Denver's residential soils, because, if the source of that contamination is upward migration of contaminants from fill materials, the contamination is likely to recur.

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[35] *Id.* at 16

[36] Colo. Pub. Radio, *Map: In Denver, Your Neighborhood Can Say A Lot About How Long You'll Live* (Dec. 2, 2015), http://www.cpr.org/news/story/map-denver-your-neighborhood-can-say-lot-about-how-long-youll-live (Exhibit 20).

[37] Elyria-Swansea Neighborhood Plan at 1.

[38] Globeville Neighborhood Plan at 19, 84; *see also* Extreme Community Makeover, *The Neighborhood that Embodies Culture and Diversity* (last visited Apr. 5, 2019), https://www.extremecommunitymakeover.org/lifestyle/the-neighborhood-that-embodies-cultureanddiversity/ (Exhibit 21) (describing Orthodox Food Festival and Old Globeville Days).

[39] Black American West Museum & Heritage Center, *Visitor Information* (last visited Apr. 5, 2019), https://bawmhc.org/explore/visitor-information/ (Exhibit 22); Hayley Sanchez, *The Smithsonian Is Preserving Denver's Black History, Starting with Family Photos*, Colo. Pub. Radio (Nov. 2, 2018), https://www.cpr.org/news/story/the-smithsonian-is-preserving-denvers-african-american-history-starting-with-family (Exhibit 23).

1. CDPHE Discovers Soil Contamination in North Denver in 1997.

After a decade of litigation, in 1993, the State of Colorado entered into a consent decree with the Asarco Globe Smelter, requiring Asarco to remediate soils in the surrounding residential properties with cadmium, lead, and arsenic concentrations above 70 parts per million ("ppm"), 500 ppm, and 70 ppm, respectively.[40] The consent decree required Asarco to collect soil samples from residential yards throughout Globeville.[41]

By 1997, Asarco had "established the extent of lead and cadmium contamination in Globeville but continued to find random occurrences of elevated levels of arsenic in residential yards at greater distances from the Globe plant site," a phenomenon it referred to as the "arsenic anomaly."[42] Asarco sought to avoid responsibility for additional remediation, claiming that "remediating community soils based on the block-by-block approach causes Asarco to address areas that exceed the action levels for arsenic and lead that are not due to the Globe plant."[43]

While Asarco attempted to resolve this dispute about the extent of its remediation obligations with the Colorado Department of Public Health and Environment ("CDPHE"), CDPHE undertook its own soil sampling program in Elyria and Swansea during 1997.[44] Although the Globe Smelter was located west of I-25, CDPHE was investigating whether contaminants had been transported downwind to residential properties east of the river.[45] This theory—that atmospheric deposition of contaminants from smelter smokestacks is main source of soil contamination in the VB/I-70 Superfund Site—has persisted, despite a lack of factual support, for the past two decades.

CDPHE took 25 surface soil samples from residential properties located between I-70, the National Western Stockyard, Vasquez Boulevard, and 48th Avenue.[46] CDPHE analyzed the samples for arsenic, lead, and cadmium.[47] Six of the 25 samples had arsenic or lead

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[40] Bonnie Lavelle, EPA Region VIII, *Vasquez Boulevard/Interstate 70 Superfund Site, Denver Colorado: Information Package for the EPA National Remedy Review Board* at 3 (Jan. 6, 2003) ("2003 Information Package") (Exhibit 28).
[41] *Id.*
[42] *Id.*
[43] *Id.*
[44] *Id.* at 4; *see also* 84 Fed. Reg. at 2118; Mark Rudolph & Kenton Alexander, URS Operating Servs., Inc., *Sampling Analysis Report for Removal Site Assessment: North Denver Residential Soils, Denver, Colorado* (July 8, 1998) ("1998 Sampling Analysis Report") (Exhibit 25); 2003 Action Memo at 5.
[45] Charles H. Norris, *Expert Report re Notice of Intent to Delete from the National Priorities List Operable Unit 1 of the Vasquez Boulevard and I-70 Superfund Site City and County of Denver, CO* at 12–13 (Mar. 4, 2019) (Submitted as Public Comment on Regulations.gov, Docket No. EPA-HQ-SFUND-1999-0010) ("Norris Report").
[46] 1998 Sampling Analysis at 1.
[47] *Id.*

concentrations above "screening levels" (500 ppm lead, and 70 ppm arsenic).[48] These results confirmed that the "arsenic anomaly" extended well beyond Globeville, and that there was lead and arsenic contamination relatively far away from Asarco and the other historic smelter locations.[49] Because of the high quantities of lead and arsenic in the residential soil, and uncertainties about how long it would take to resolve the ongoing dispute with Asarco, CDPHE requested EPA's immediate assistance to further investigate the contamination.[50]

2. EPA's Phase I Sampling: 1998

EPA responded by developing an Emergency Response Program in 1998.[51] The first component of EPA's Emergency Response Program was "Phase I Sampling." The purpose of the Phase I sampling was to determine whether time-critical soil removal was necessary to protect public health. Its purpose was not to determine the source of the contamination.[52]

EPA conducted the Phase I sampling during March and April of 1998.[53] EPA took samples from residential properties located between the Platte River to the west, Colorado Boulevard to the east, 38th Avenue to the south, and 52nd Avenue to the north.[54] EPA later described the boundaries used for the Phase I sampling as "arbitrary since little was known about a possible source of the arsenic and lead being investigated."[55] Indeed, EPA expanded its sampling boundaries in later phases of soil sampling.[56]

For the Phase I sampling, EPA took soil samples from 1,152 residential properties.[57] EPA took a total of 3,550 samples: 2,363 surface samples, 1,096 subsurface samples, and 91 field replicates (to use to verify data quality).[58] At most properties, EPA took two surface (0 to 2 inches below the surface) samples—one from the front yard, and one from the back yard—and one "subsurface" sample (6 to 10 inches below the surface).[59]

Perhaps because EPA's focus was on identifying priority areas for cleanup due to human health risks, rather than the source of contamination, EPA did not take a subsurface sample at every property. EPA's 1998 Sampling Analysis Report uses conditional language to describe the

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[48] Memorandum from Pete Stevenson, On-Scene Coordinator, Emergency Response Team, to Max Dodson, Asst. Reg'l Adm'r, EPA Region VIII, re: *Request for a Time-Critical Removal Action at the Vasquez Boulevard and I-70 (aka North Denver Residential Soils) Site, City and County of Denver, Colorado* at 2 (Sept. 16, 1998) ("1998 Action Memo") (Exhibit 26).
[49] 2003 Information Package at 4.
[50] 84 Fed. Reg. at 2118; *see also* Norris Report at 13; 2003 Information Package at 4.
[51] 84 Fed. Reg. at 2118–19.
[52] 1998 Action Memo at 2; *see also* Norris Report at 13.
[53] 2003 Action Memo at 5; 1998 Sampling Analysis at 2, 10.
[54] 1998 Action Memo at 2.
[55] Norris Report at 13.
[56] *See infra* pp. 13, 17, 26.
[57] 1998 Sampling Analysis Report at 2.
[58] *Id.*
[59] *Id.*

subsurface sampling: "[i]f a depth sample was to be collected . . ."[60] The Sampling Analysis Report further notes that 1,096 depth soil samples were taken—which is less than the 1,152 residential properties where samples were taken.[61] EPA, therefore, did not take any subsurface samples from at least 56 of the properties that it sampled.

EPA then tested all 3,550 samples for arsenic, lead, and cadmium (with 361 samples sent to an additional laboratory for secondary testing as a quality control measure).[62] Of the 1,152 properties, 46 properties (4.2%) measured arsenic levels above 400 ppm, and/or lead concentrations above 2000 ppm,[63] making them candidates for time-critical soil removal. EPA decided that nine of the 46 properties did not require immediate remediation.[64] One property was a parking lot.[65] Another "consists of an old house with flaking paint and no signs of children."[66] The other seven registered elevated lead and/or arsenic concentrations in their subsurface samples, and EPA therefore concluded that the contamination at those properties "d[id] not pose an immediate threat and will be left for remedial action."[67] In other words, because the high levels of contamination were found six inches or more below the surface, and not at the surface, EPA deemed these properties not to be a priority for immediate soil removal.[68] EPA did not conclude that subsurface contamination did not exist—only that it posed less of an immediate health risk to north Denver's residents.

This is the first of many, but one of the clearest, examples of EPA's repeated and systematic bias towards focusing on surface level contamination. This bias has caused the agency to overlook the need to further investigate—and remediate—contamination even just a few inches deeper in north Denver's residential soils.

3. EPA's Phase II Sampling: 1998

EPA conducted Phase II sampling during July and August of 1998.[69] EPA was still attempting to parse the data it gathered in Phase I, which displayed a random pattern of contamination not consistent with EPA's atmospheric deposition hypothesis.[70] EPA expressed

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[60] *Id.* at 2–3.
[61] *Id.* at 2. Similarly, the 1998 Action Memorandum states that "EPA sampled approximately 1,200 residential properties." 1998 Action Memo at 2. It also states that 3,550 samples were taken. *Id.* Simple math reveals that, if 3,550 samples were taken, at three samples per property, then EPA would have sample 1,183 properties—more than the 1,152 properties it actually sampled.
[62] 1998 Sampling Analysis Report at 5–8, 10.
[63] *Id.* at 10. An additional 248 properties (22.6%) measured arsenic levels between 70 and 399 ppm and/or lead levels between 500 and 1999 ppm. *Id.*
[64] 1998 Action Memo at 2.
[65] *Id.*
[66] *Id.*
[67] *Id.*
[68] *Id.*
[69] *Id.*
[70] Norris Report at 21.

uncertainty about this hypothesis, noting that "[t]hese hazardous substances may have been released into the residential soils by historic smelting activities and spread through the community by aerial deposition."[71]

EPA thus launched Phase II sampling because it believed more information—and soil testing—was necessary before conducting time-critical soil removal at the 37 properties identified in Phase I.[72] EPA stated that "[t]he need for expanding the project boundaries has arisen as a result of Phase I of field work."[73] EPA thus decided to expand the southern border of Phase II analysis to 35th Avenue, and to do additional sampling at residences adjacent to properties that had lead or arsenic above the target level (70 ppm arsenic and 500 ppm lead).[74] At CDPHE's request, EPA also elected to sample part of Globeville neighborhood that had not previously been sampled, located west of I-25, south of I-70, east of Fox Street, and north of 38th Avenue.[75]

As a result, EPA used Phase I sampling methods to sample an additional 297 properties, bringing the total number of properties sampled to 1,393.[76] Among these newly sampled properties, EPA did not identify any properties with lead levels above 2000 ppm or arsenic levels above 450 ppm—the threshold for time-critical soil removal.[77] EPA identified a total of 143 properties as requiring non-time-critical remediation based on the combined results of the Phase I and II sampling.[78]

In addition to broadening the geographic scope of properties subject to Phase I sampling techniques, EPA also collected additional samples from the 37 properties identified in Phase I sampling with surface soil concentrations above 450 ppm arsenic or 2000 ppm lead.[79] As noted above, this subset of properties only included those with surface samples registering above the threshold—EPA excluded properties with subsurface lead and arsenic levels above the threshold.

When EPA revisited these properties for Phase II, it used a different sampling method. At each property, EPA took five samples (only from the surface level), including samples from both front and back yards.[80] EPA used a composite sampling method—combining the five

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[71] 1998 Action Memo at 3 (emphasis added)
[72] 2003 Action Memo at 5
[73] 1998 Sampling Analysis Report at 10
[74] *Id.*
[75] *Id.*
[76] 2003 Action Memo at 5–6; *see also* CB&I Federal Servs., LLC, *Final Remedial Action Report: Vasquez Boulevard/Interstate 70 Operable Unit 1 – Residential Soils, Denver, Colorado, CERCLIS ID: CO0002259588* at 2–3 (Feb. 2017) ("2017 FRAR") (Exhibit 27).
[77] Norris Report at 15.
[78] *See* 2017 FRAR at 2–3 (explaining that a total of 143 properties were remediated); 2003 Action Memo at 4 (explaining that 5 of the 143 properties were on the list for time-critical remediation, but the property owners refused denied access to perform the remediation).
[79] 2003 Action Memo at 5.
[80] Norris Report at 14.

samples taken from each property into a single sample for analysis.[81] This method of sampling masks "hot spots"—single samples with unusually high lead or arsenic concentrations.[82] From the outset, community members expressed concern about composite sampling, noting that "EPA might miss 'hot spots' of concern to children's health."[83] The result of EPA's composite sampling method is that properties with uniformly high levels of contamination were identified as candidates for time-critical remediation, and properties with very high levels of lead and/or arsenic in only part of their yard were not.

Of these 37 properties tested, EPA identified 21 properties for time-critical removal, because their surface soil exceeded the 450 ppm arsenic and/or 2000 ppm lead threshold.[84] EPA conducted time-critical remediation at 18 of these 21 properties, where the agency was allowed access by the property owner. *Id.*

4. CDOT's 1998 Brighton Boulevard Interchange Soil Study

EPA was not the only government agency studying north Denver's soil during the late 1990s. In July 1998, the Colorado Department of Transportation ("CDOT") released its Final Site Investigation for changes to I-70's Brighton Boulevard interchange.[85] Although some of this area falls within OU2, much of it is within the OU1. Moreover, OU2 itself is within the geographic boundaries of OU1. Its environmental conditions are thus likely similar to those of the surrounding neighborhoods.[86] CDOT conducted the study because prior investigations had identified several concerns in the area, including soil contamination from leaking underground storage tanks, chlorinated solvents in the area's groundwater, and, most saliently, "possible soil contamination by heavy metals from smelter wastes near Humboldt Street and tannery wastes near Brighton Boulevard."[87] CDOT explained that, in addition to the smelters historically located in the area, a property located immediately east of the Denver Coliseum along Brighton Boulevard "was formerly a tanning operation or abattoir [slaughterhouse]."[88]

CDOT's investigation discovered "fill material containing elevated concentrations of lead and arsenic, presumably composed in part of smelter wastes from the Omaha and Grant Smelter."[89] This was in addition to "discolored fill material containing metals, PAHs and oil" that had previously been discovered.[90] CDOT explained that "[e]xtensive areas of fill have been documented on the grounds of the Denver Coliseum," and that "the Coliseum was once the site

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[81] *Id.*
[82] Norris Report at 14.
[83] 2003 Information Package at 15–16.
[84] 2003 Action Memorandum at 5.
[85] Robert C. German, Walsh Envtl. Scis. & Eng'rs, Inc., *Final Site Investigation: I-70 Phase II and III Construction: 44th Street to Brighton Boulevard, City and County of Denver, Colorado* at p. iv (July 1998) ("1998 I-70 Site Investigation") (Exhibit 29).
[86] *See* Norris Report at 24.
[87] 1998 I-70 Site Investigation at iv.
[88] *Id.* at 6.
[89] *Id.* at iv.
[90] *Id.* at iv.

of an extensive sand and gravel quarry which was subsequently filled with smelter slag and waste rock, and demolition debris from the Omaha and Grant Smelter."[91] CDOT further noted that "the gravel pit depressions were filled with domestic trash before the area was cleared for parking areas in the late 1940s."[92] CDOT also documented "5 to 15 feet of fill material . . . under the east-bound lane of I-70," and noted that "[l]esser amounts of fill (0 to 5 feet) have been found in the [Brighton Boulevard interchange] construction area."[93] Although the Coliseum area is technically part of OU2, not OU1, OU2 itself is entirely within the geographic boundaries of OU1. CDOT's findings in this area are therefore highly relevant because they demonstrate the extent of the significant use of fill material in north Denver. It is likely that similar fill materials (including smelter waste, coal ash, tanning waste, and other sources) would have been used as fill materials in the adjacent OU1 areas.

CDOT conducted soil borings at several sites in the area, which appear to all fall within OU1, rather than OU2, including multiple soil borings to a depth of 10 feet "to investigate the presence of heavy metals in soils associated with the use of smelter waste as fill material."[94] In addition to smelter waste, CDOT's deep boring uncovered "black material" consisting of fill that did not appear to resemble smelter waste, but instead contained "brick and asphalt fragments, and possibly coal dust."[95] Nearly all of the boring conducted for the study encountered some kind of fill material.[96]

When CDOT analyzed the boring samples, it found "[e]levated concentrations of arsenic (93 mg/kg), lead (970 mg/kg) and silver (4.3 mg/kg) . . . in the black fill material."[97] While the elevated concentration of silver suggested that at least some of the material was coal dust, "at least a portion of this fill is comprised of smelter waste from the former Omaha and Grant Smelter."[98] Lead levels in that sample were above 500 ppm, the action level set by the Asarco Consent Decree.[99]

CDOT's investigation found numerous other contaminants in the soil beyond those that would be associated with using smelter waste a fill. Among other things, CDOT documented:

- Benzene, toluene, ethylbenzene and xylenes ("BTEX") in the ground water sample, at levels above Colorado's maximum contaminant level, presumably caused by a leaking underground storage tank.[100]
- Semi-volatile organic compounds, consisting of, among other things, paraffins. and bio-organic compounds. CDOT could not identify the

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[91] *Id.* at 4.
[92] *Id.*
[93] *Id.*
[94] *Id.* at 6.
[95] *Id.* at 11.
[96] *See id.* at 10–17.
[97] *Id.* at 24
[98] *Id.*
[99] *Id.*; *see also id.* at 40.
[100] *Id.* at 27.

source of these contaminants, but speculated that they could be attributable to, among other things, a component of the fill material used to bring the parcel where they were discovered to grade.[101]

- Perchloroethylene in the ground water, from an unknown source.[102]
- Diesel-range hydrocarbons, and ground water that was discolored with a mild petroleum odor and spotty sheen. CDOT concluded that an unused gasoline dispenser and underground storage tank either onsite or upgradient was the most likely source of these hydrocarbons.[103]
- Elevated concentrations of cadmium, chromium, lead and mercury in stained, shallow (0-1.5 feet) fill material. These soils were not detected below 4 feet and rested on naturally-occurring clay.[104]

Rather than focusing narrowly on a single source (and a limited range of pollutants), CDOT's sampling took a holistic approach and sampled soils at multiple depths, as well as groundwater, for many pollutants—and this approach revealed widespread contamination. Indeed, the contamination listed above is only the tip of the iceberg of what is documented in CDOT's investigation. The results of CDOT's study underscore that north Denver's neighborhoods have an industrial history of not only smelters, but also numerous kinds of other industrial sites. CDOT was unable to attribute a source to all the contaminants it discovered, but recognized that there could be a plethora of potential sources of contamination in the surface soil, subsurface soil, and underlying groundwater.

5. EPA Adds the VB/I-70 Site to the NPL

Even though CDOT was contemporaneously taking deeper soil samples in the same area, discovering elevated levels of multiple pollutants, and finding that smelter wastes and other contaminated soil had been used as fill material, EPA remained myopically focused on surface contamination caused by atmospheric deposition from the area's smelters.

In January 1999, based on the information it gathered in the Phase I and II sampling, EPA proposed to add VB/I-70 to the NPL.[105] EPA's proposal does not state the basis for why it chose to add the site to the NPL.[106] However, in later documents, EPA stated that "[b]ased on the results of the Phase I and Phase II sampling programs, EPA determined that numerous residential properties within the Site contained concentrations of arsenic or lead at levels that could present unacceptable health risks to residents with long-term exposures."[107] This is consistent with the regulatory criteria for adding sites to the NPL, which include that "EPA determines that the release poses a significant threat to public health."[108]

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[101] *Id.* at 26
[102] *Id.*
[103] *Id.* at 27.
[104] *Id.* at 28.
[105] 64 Fed. Reg. 2950, 2955 (Jan. 19, 1999).
[106] *See id.*
[107] *See, e.g.*, 84 Fed. Reg. at 2119.
[108] 40 C.F.R. § 300.425(c)(3)(ii).

EPA did not state that it had determined the source of the "release" (or the contamination) when it added the site to the NPL. Nor was it required to do so by statute or regulation. Later, the agency admitted that "[a]t the time of the NPL listing proposal, EPA had little information about the possible source or sources of lead or arsenic in soil."[109]

EPA divided the VB/I-70 site into three "operable units." EPA defined the boundaries of OU1 "narrowly . . . as only those residential yards with levels of lead or arsenic in soil that present an unacceptable risk to human health."[110] EPA recognized that "numerous commercial and industrial properties are located within OU-1," but nevertheless concluded that "these properties are not considered to be part of the VB/I-70 Site," because "the highest potential for exposure to the human population [is] in the residential yards.[111] EPA defined the boundaries of OU1 as Martin Luther King Boulevard to the south, 52nd Avenue to the north, Colorado and Vasquez Boulevards to the east, and the Platte River to the west, as well as the southwest portion of Globeville.[112] EPA also designated OU2—the location of the former Omaha and Grant smelter, and OU3—the location of the former Argo Smelter.[113]

During the comment period, on March 16, 1999, the Agency for Toxic Substances and Disease Registry ("ATSDR") sent a letter to EPA, expressing concern that the Phase 1 grab sampling method of gathering just two surface samples and one subsurface sample was "not sufficient to characterize human exposure to contaminants in soil."[114] This is significant because this sampling method (or variations of it, such as composite surface sampling), was the primary method EPA used to sample OU1 soils.[115]

EPA finalized its decision and added the site to the NPL on July 22, 1999.[116]

6. EPA Attempts, Unsuccessfully, to Determine the Cause of Lead and Arsenic Contamination in OU1.

By the summer of 1999, EPA had determined that arsenic and lead contamination in north Denver's residential soils posed a health risk, had added the VB/I-70 site to the NPL, and was already undertaking time-critical soil removals. However, EPA concluded that the "data from Phase I and II" were "too limited to be the basis of remedial decisions," because "many

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[109] 2003 Information Package at 6.
[110] 2003 Action Memo at 4.
[111] *Id.* at 4, 6
[112] *Id.* at 3.
[113] *Id.* at 6.
[114] Letter from David Mellard, Agency for Toxic Substances and Disease Registry, to Bonnie Lavelle, EPA Region VIII at 1 (Mar. 16, 1999) ("ATSDR Letter") (Exhibit 30).
[115] 1998 Sampling Analysis Report at 2, 10; Washington Grp. Int'l, *Final Remedial Investigation Report: Vasquez Boulevard/I-70 Site Operable Unit 1* at 1-1 (July 2001) ("2001 FRIR") (Exhibit 31).
[116] 64 Fed. Reg. 39,878, 39,884 (July 22, 1999).

samples had elevated detection limits for arsenic, the sampling density at each property was too low, and/or sampling locations were not clear."[117]

Moreover, EPA had not yet identified the source of the lead and arsenic contamination that it found in the soil. Despite contrary data, EPA continued attempting to validate its initial assumption that the contamination source was atmospheric deposition from the smelters. However, the agency began to admit that there might be more to the story. In September 1999, EPA stated that "atmospheric deposition of smelter emissions or importation of fill material from locations contaminated with smelter waste" could have caused the contamination.[118]

EPA's uncertainty was due to the fact that, if atmospheric deposition was really the source of the heavy metal contamination in the soil, the contamination would display a standard dispersion pattern, with higher lead and arsenic concentrations found in soils closer to the smelter locations. But, as EPA explained, there was "no discernable pattern for the extent of the metals contamination."[119]

Attempting to resolve this uncertainty, EPA launched additional studies to further investigate the cause and extent of contamination in north Denver's residential soils. But each of these efforts was premised on testing EPA's atmospheric deposition hypothesis. As a result, they did not gather information that would allow for testing other hypotheses—especially the hypothesis that the origin of the contamination was fill dirt.[120] It is thus unsurprising that EPA's additional studies ultimately did not identify the cause of the contamination. By 2003, the agency concluded that "[t]he source of arsenic and lead in the soil of impacted residential properties in the VB/I-70 Site is not known."[121]

a. Residential Risk Sampling

In 1998, EPA conducted high-density, intensive "residential risk" sampling in order to: (1) characterize the extent of arsenic, lead, cadmium, and zinc contamination in specific residential yards; (2) quantify the concentrations of those metals in indoor and outdoor environmental media with high propensity for human exposure (indoor dust, tap water, and paint, and outdoor vegetable gardens); and (3) estimate human exposure through a biomonitoring program.[122]

EPA conducted the sampling at eight properties, including the five properties selected for time-critical soil remediation which had the highest arsenic concentrations.[123] The other three

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[117] 2003 Information Package at 10.
[118] Bonita Lavelle, EPA Region VIII & ISSI Consulting Grp., Inc., *Project Plan for the Vasquez Boulevard & I-70 Site, Denver CO: Pilot-Scale Soil Characterization Study* at 1–2 (Sept. 9, 1999) ("1999 Soil Characterization Report") (Exhibit 32).
[119] 2001 FRIR at 3-5
[120] *See* Norris Report at 20.
[121] 2003 Action Memo at 3.
[122] 2001 FRIR at 3-4 to 3-5.
[123] *Id.* at 3-5.

properties EPA examined were Phase I properties that had not qualified for removal action.[124] At these properties, EPA took two sets of samples. The first were surface samples taken from throughout a property's yard.[125]

The second set of samples were subsurface samples. This was only the second—and final—time that EPA took subsurface samples throughout the course of its investigation into the contamination in north Denver. EPA took a total of 36 soil profiles (measuring soil every two inches at up to 12 inches) from throughout the eight yards, including at least two profiles from each property, and up to nine at one property.[126] These vertical profile samples were the only sampling EPA conducted throughout the lifetime of the VB/I-70 cleanup process that reached a depth of 12 inches. EPA has never sampled soils from deeper than 12 inches. The subsurface sampling was also less extensive than the surface sampling. Although EPA took between 20 to 100 surface samples at various properties, it took only two to eight core samples per property.[127]

Crucially, five of the eight properties subject to the Residential Risk Sampling (those known to have high arsenic levels) were among the 21 properties that EPA identified as having elevated surface contamination levels during Phase I.[128] In other words, EPA conducted the subsurface sampling at properties that it had already determined had surface, but not subsurface, contamination. EPA did not conduct additional subsurface sampling at the seven properties it identified as having dangerously high levels of subsurface lead and arsenic contamination during Phase I.

b. Physico-Chemical Characterization Study

Around the same time, EPA also re-analyzed 120 of the Phase I samples to generate additional data about physical and chemical soil characteristics.[129] EPA did not re-analyze any of the subsurface samples.[130] The study found comparable level of lead, and slightly higher levels of arsenic and cadmium, in fine soils (compared to coarse soils).[131]

c. Phase III Sampling

The information EPA gathered from the Physico-Chemical Characterization Study and the Risk-Based sampling program convinced the agency that "additional data was needed to improve remedial decisions at OU1."[132] EPA determined that the data it gathered during Phase I

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[124] *Id.* at 3-5 to 3-6.
[125] *Id.* at 3-6.
[126] *Id.*; *see also* Norris Report at 17; Memo. from Mary Goldade, ISSI Consulting Grp., to Chris Weis & Bonnie Lavelle, re: *Phase 3 Investigation – Rationale for Collecting Surface Soil Samples Only* at 1 (June 18, 1999) ("1999 Rationale") (Exhibit 37).
[127] 2001 FRIR at E3-1 to E3-8
[128] *See* Norris Report at 18.
[129] 2003 Action Memo at 7.
[130] Norris Report at 16.
[131] *Id.*
[132] 2003 Information Package at 10

and II were too limited to support a reliable risk assessment.[133] Additionally, the data gathered in Phase I and II did not display a spatial pattern.[134] Among other things, EPA realized that "[t]he lack of spatial pattern to the arsenic contamination indicated that essentially every property within the study area should be sampled since it would not be possible to predict levels in an individual yard by considering levels in yards within the vicinity."[135]

EPA thus decided to conduct a "Phase III" investigation with two goals: (1) "collect sufficient data to support a quantitative baseline human health risk assessment which would provide the basis for risk management decisions," and (2) "collect sufficient data to define the nature and extent of contamination."[136]

EPA conducted the Phase III sampling between August 1999 and November 2000. Despite its professed goal of collecting data sufficient to define the nature and extent of the contamination, EPA continued to focus only on surface sampling. EPA defined the extent of contamination as only the top two inches of soil.[137] EPA again overlooked residents concerns with masking hot spots, and again utilized composite sampling techniques designed specifically to obtain "an average concentration over the entire yard."[138]

Notably, the Phase III "Rationale"—which EPA later cited repeatedly as the basis for its conclusion that only surface sampling was necessary—included a misleading statemnet that "[p]aired surface soil and depth samples were collected in [earlier] sampling programs"—Phases I and II.[139] But this is misleading, because, as discussed above, during Phases I and II, EPA did not collect a subsurface sample from every property.[140]

Phase III sampling did expand beyond residential surface soil to also consider indoor dust, vegetable garden soil, and schools and parks.[141] EPA initially targeted properties that were not sampled during Phases I and II, and "subsequently encompassed" all 4000 residential properties in OU1.[142] Despite this "4000 properties" statement, in 2001, EPA stated that it sampled a total of 3007 properties during Phase III: 2989 residential properties, 10 schools, seven parks, and one government property.[143]

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[133] 2003 Action Memo at 7.
[134] Norris Report at 18; *see also* 2001 FRIR at ES-3, 3-18.
[135] 2003 Information Package at 10.
[136] *Id.*
[137] Norris Report at 18.
[138] 2001 FRIR at ES-3, 3-23 to 3-24.
[139] 1999 Rationale at 1.
[140] *See supra* pp. 11–12 & n.61.
[141] 2003 Action Memo at 7.
[142] *Id.*
[143] 2001 FRIR at ES-2.

Based on the results of the Phase III investigation, EPA identified 30 additional properties with arsenic levels above 400 ppm, and conducted time-critical soil removals at these properties.[144]

Even though Phase III sampling and the contemporaneous investigations included little to no subsurface sampling, EPA relied on this Phase III sampling to later decide that there was no subsurface contamination, that remediation of soils to only 12 inches below the surface was adequate to protect human health, and that only surface sampling was necessary.[145]

d. EPA's 2001 Final Remedial Investigation

EPA summarized the findings of all its studies and sampling in a 2001 Remedial Investigation report. Among other things, EPA concluded that there was a weak correlation between elevated lead and elevated arsenic in the residential soil, suggesting they had different sources.[146] Specifically, "[c]orrelation analysis indicates that knowing the concentration of either arsenic or lead provides very little information regarding the concentration of the other."[147] EPA later explained that "[a] scatterplot of lead and arsenic data indicates a wide pattern of dispersion between individual arsenic/lead pairs, indicating that knowing the concentration of either arsenic or lead provides very little information regarding the concentration of the other."[148]

EPA also concluded that "[p]roperties with elevated levels of arsenic occur at widely scattered locations across the Site, with no clear spatial pattern."[149] EPA explained that its models "indicate a high degree of randomness spatially, suggesting that contaminant emplacement was somewhat random and on a local basis, rather than being caused by a point source that influenced a relatively large region."[150] EPA was explicit that "no discernable pattern for the extent of the metals contamination was apparent."[151] Moreover, "marked differences in metals concentrations were noted even among grab samples collected at a single residence."[152] Finally, in a contemporaneous document, EPA conceded that "[t]he arsenic anomaly in the greater Denver area has been studied intensely for the past decade. . . . Because of the site complexity . . . no one study has been able [to] scientifically determine the source(s) of the contamination."[153]

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[144] 2003 Action Memo at 7.
[145] *See infra* p. 38.
[146] 2003 Action Memo at 8; *see also* 2001 FRIR at ES-3.
[147] 2001 FRIR at 4-8.
[148] 2003 Information Package at 20.
[149] 2003 Action Memo at 8; *see also* 2001 FRIR at ES-3, 4-6.
[150] 2001 FRIR at 4-8.
[151] *Id.* at 3-5.
[152] *Id.*
[153] Univ. of Colo., Boulder CO, Dept. of Geological Scis., *Vasquez Boulevard and I-70 Site Pilot-Scale Soil Characterization Study: Mineral Phase Speciation and Bioaccessibility* at 13 (Nov. 1, 2001) ("2001 Soil Characterization Study") (Exhibit 34).

EPA did note that there was somewhat more of a trend, though still not a strong trend, for lead, with higher levels found at the western end of OU1 (closer to the smelters).[154] However, it labeled this evidence "inconclusive due to large areas that were not sampled."[155] EPA also noted that while lead concentrations were "generally" higher in the west with a "relatively systematic" decrease moving away from the historic smelter areas, "[a]reas of high local variability are also present in numerous areas."[156]

The FRIR systematically overlooks the possibility of subsurface soil contamination. For example, it states, incorrectly, that two surface samples and one subsurface sample were taken at every property during Phase I sampling.[157] But, as discussed above, EPA did not, in fact, take even a single subsurface sample at every property during Phase I.[158]

Although EPA was unable to identify the cause of the lead and arsenic contamination in north Denver's soil, the data the agency gathered were sufficient to determine that the contamination posed a health risk. EPA concluded that, "in some yards within the VB/I-70 site, levels of arsenic in yard soil are sufficiently elevated to pose a [reasonable maximum exposure] lifetime cancer risk above" 1 in 10,000.[159] EPA further concluded that "about 45% of residences have [lead] levels that exceed EPA's health-based goal," many of which were properties with soil contamination at levels lower than EPA's 400 ppm level of concern.[160]

7. Despite Uncertainty About the Cause of OU1's Lead and Arsenic Contamination, EPA Finalizes a Cleanup Plan

Having spent 1998 through 2001 gathering and analyzing soil data, EPA transitioned into developing a remediation plan. This consisted of two main components: "non-time-critical removal" for properties with especially high arsenic and lead concentrations that were not subject to the earlier "time-critical removal," and "remedial action" for properties with lower, but still elevated, levels of lead and arsenic.[161] Yet, as discussed above, despite the years of investigation, EPA remained unsure about the actual cause of the lead and arsenic contamination in north Denver's soil. EPA's chosen remedy is therefore likely insufficient to address the full extent of contamination, and preventing the recurrence of the contamination.

a. Information Package for EPA National Remedy Board

EPA's first step in developing a remediation plan was a January 6, 2003 Information Package sent from EPA Region VIII to EPA's National Remedy Review Board.[162] In this

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[154] 2003 Action Memo at 8; *see also* 2001 FRIR at 4-6.
[155] 2001 FRIR at 4-8.
[156] 2003 Information Package at 21.
[157] 2001 FRIR at 1-1
[158] *See supra* pp. 11–12 & n.61.
[159] 2001 FRIR at 5-16.
[160] *Id.*
[161] *See* 84 Fed. Reg. at 2119.
[162] 2003 Information Package at 1.

document, EPA again reiterated its conclusion that VB/I-70 "is an Environmental Justice (EJ) site because the community is predominantly low income and minority and is disproportionately affected by environmental impacts from many sources, including other Superfund sites, and major transportation corridors."[163] EPA described the history of smelters in north Denver, CDPHE's dispute with Asarco, the discovery of the "arsenic anomaly," and CDPHE's independent sampling that led it to request EPA's assistance.[164] EPA summarized its Phase I and II sampling and the time-critical removal action it took in 1998.[165]

After providing this background, EPA dived into its investigation of the contamination's cause—but was transparent that this was still unknown, and that atmospheric deposition from smelters could not be the sole cause of the contamination. The agency admitted that "at the time of the NPL listing proposal, EPA had little information about the possible source or sources of lead or arsenic in the soil."[166] Still focused on smelters, EPA noted that, in addition to Asarco, there were two historic smelters (Argo and Omaha & Grant) in the area.[167] However, EPA acknowledged that "the arsenic and lead in the residential soils of the VB/I-70 site could not be readily explained by emissions from the Asarco Globe Plant."[168]

Finally, EPA pointed to a public comment submitted by Asarco during the proposed NPL listing for the VB/I-70 site, which attempted to shift the blame away from smelters altogether and suggested that a residential lawn care product available in the 1950s through 1970s could be the source of the arsenic contamination.[169] However, EPA later conducted additional investigation into the lawn care products Asarco identified, and determined that that it could not be the sole explanation for the arsenic anomaly.[170] EPA specifically found that "[t]he data support the conclusion that of the residential soils with highly elevated arsenic and lead concentrations, only a few soils could be, contaminated primarily by [the lawn-care product Asarco identified]," and "[i]n fact, the [data] would suggest at least a two source mechanism."[171] CDPHE had already rejected this explanation for the arsenic anomaly in its own 1998 analysis.[172]

After this discussion of the potential (and still unknown) causes of the contamination, EPA summarized the intent behind, design of, and results of each of the components of its remedial investigation.[173] Among other things, EPA noted that during Phases I and II, "no systematic evaluation had been performed to determine whether or not any other chemicals

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[163] *Id.*
[164] *Id.* at 2–4.
[165] *Id.* at 4–6.
[166] *Id.* at 6.
[167] *Id.*
[168] *Id.* at 7.
[169] *Id.*
[170] Norris Report at 22–23.
[171] 2001 Soil Characterization Study at 13.
[172] Norris Report at 23.
[173] 2003 Information Package at 8–11.

might also be of potential concern."[174] EPA also stated, incorrectly, that "[a]vailable data on lead and arsenic levels in residential soils were sufficient to establish that concentrations of contaminants in subsurface soil are lower than in the surface soil," which is why Phase III was limited to only the top two inches of soil.[175]

EPA next described its analysis of the Phase III data, and reiterated the conclusions from the 2001 Final Remedial Investigation Report that lead and arsenic are poorly correlated, and that arsenic is scattered randomly while lead is slightly more correlated with proximity to historic smelter locations.[176] Based on this information, EPA drew two important conclusions. First, that "[d]ue to the distinctly different spatial patterns exhibited by arsenic and lead in the surface soils, it appears that the two contaminants may have been emplaced by means of different mechanisms, one largely random, the other a more continuous spatial pattern."[177] Second, EPA concluded that homes built before 1960 were much more likely to have high levels of arsenic contamination, and that newer homes were likely to have lower levels of lead contamination.[178]

Finally, EPA summarized its extensive analysis of acute and chronic, cancer and non-cancer human health risk exposures to children and adults, residents and workers, from the measured levels of lead and arsenic through various pathways, including soil pica behavior, soil inhalation, dermal contact, and eating home-grown vegetables.[179] EPA concluded that "remedial action is warranted" in yards with lead and arsenic soil concentrations above various levels.[180]

Finally, EPA evaluated six alternatives for remediation plans, all of which involved some combination of community health programs, soil removals, and additional sampling.[181] EPA selected Alternative 6, the most protective alternative, which required soil removal from properties with arsenic concentrations above 70 ppm and lead concentrations above 400 ppm, the same remediation thresholds used for the Asarco Globe site.[182] Notably, none of the alternatives that EPA considered involved subsurface soil sampling, or additional efforts to determine the still-unknown cause of lead and arsenic contamination in north Denver's residential soils.

b. 2003 Action Memorandum

On March 6, 2003, EPA Region VIII issued an "Action Memorandum," formally requesting approval to conduct non-time-critical soil removal in OU1. The Action Memorandum largely reiterated information found in other documents. However, it included several formal conclusions. First, it found that non-time-critical removal action was "appropriate" under 40 C.F.R. § 300.415(b)(2) because of "actual or potential exposure to nearby human populations . . .

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[174] *Id.* at 11–12.
[175] *Id.* at 14.
[176] *Id.* at 20–21.
[177] *Id.* at 21.
[178] *Id.* at 21.
[179] *Id.* at 21–43.
[180] *Id.* at 43.
[181] *Id.* at 44–67
[182] *Id.* at 56, 66.

from hazardous pollutants or contaminants," and that "[t]here is no other existing mechanism to respond to the release of arsenic and lead in soils within OU1 of the VB/I-70 Site."[183] EPA also made a formal "Endangerment Determination," that "[a]ctual or threatened releases of hazardous substances from this Site, if not addressed by implementing the non-time-critical response action selected in this Action Memorandum, may present an imminent and substantial endangerment to public health or welfare or the environment."[184]

The Action Memorandum planned to complete non-time-critical soil removal by September 2003 and finish with maintenance and monitoring activities by April 2004.[185] Pursuant to the Action Memorandum, EPA conducted soil cleanup at 133 of the 143 properties identified as priorities by Phase III sampling results (meaning they had arsenic levels above 240 ppm and/or lead levels above 540 ppm).[186] The remaining 10 properties were included in the list of properties subject to later "remedial action."[187]

c. 2003 Record of Decision

Six months later, in September 2003, EPA issued the Record of Decision ("ROD"), formally selecting a remedy and approving remedial action for OU1.[188] At this crucial juncture—when EPA made a plan to remediate the lead and arsenic contamination it had been investigating for years—the agency still did not know the cause of the contamination. Yet after this juncture, EPA ceased exploring the cause of the contamination, and whether there could be other contaminants of concern besides lead or arsenic.

The ROD selected Alternative 6 as the chosen alternative.[189] Alternative 6 included three components:

First, EPA committed to undertaking soil removal at all properties with surface concentrations above 70 ppm arsenic and 400 ppm lead.[190] EPA only chose to remove the top 12 inches of soil.[191] EPA stated, incorrectly, that "contamination was only found in the top 3-6 inches."[192] EPA thus considered excavation to 12 inches to be adequate for removing all lead and arsenic contamination in the soils.[193] Contradicting this statement, in response to a comment arguing that EPA should have remediated only the top 6 inches of soil, EPA stated that while its

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[183] 2003 Action Memo at 10.
[184] *Id.*
[185] *Id.* at 13.
[186] 84 Fed. Reg. at 2119.
[187] *Id.*
[188] 2003 ROD at i.
[189] *Id.* at iii.
[190] *Id.*
[191] *Id.*
[192] 84 Fed. Reg. at 2120.
[193] EPA Region VIII, *Explanation of Significant Differences: Operable Unit 1, Vasquez Boulevard/Interstate 70, City and County of Denver, Colorado* at 3 (Sept. 2014) ("2014 ESD") (Exhibit 38).

Remedial Investigation "data demonstrated that the highest concentrations of lead and arsenic occur in the 0 – 2 inch depth, levels of lead and arsenic above the clean up levels selected in this Record of Decision could be present at 6 inches depth."[194] Thus, in the same document where EPA justified its decision that only surface contamination was a concern, it also acknowledged that subsurface contamination could be present.

To accomplish soil removal, EPA committed to backfill removed soil with clean soil that was "at or below action levels" and consult with property owners to restore pre-remediation yard features.[195] Property owners were given the option to ask for individual sampling of flower and garden beds, and if the test showed that lead and arsenic contamination in the garden beds were below the action levels, EPA would not remove the soil.[196] This was the only situation where EPA would conduct partial soil removal.[197] EPA estimated that it would conduct remediation at 853 residential properties: 508 for arsenic, 237 for lead, and 108 for both lead and arsenic.[198] It decided that the primary destination for removed soils would be either solid waste landfills or for use as cover and grading materials as part of the remediation of the Asarco Globe Plant site.[199]

Second, EPA committed to an ongoing sampling program at residential properties that had not yet been adequately tested.[200] Prior to issuing the ROD, EPA had sampled only 75% of residential properties within the OU1 boundaries for lead and arsenic.[201] EPA explained that because the spatial pattern of contamination was so variable, it was not possible to assess which properties required soil removal without actually gathering specific data from each property.[202] EPA also committed to soil sampling in an adjacent area outside OU1—between Downing Street, Blake Street, and 34th Avenue.[203]

Finally, EPA chose to implement a community health program to provide health education and biomonitoring to measure urinary arsenic and blood lead levels in children.[204] One purpose of the community health program was to evaluate soil pica behavior and the potential health consequences of oral arsenic exposure, with additional follow up measures built in for children who were demonstrating pica behavior.[205] Other purposes included reducing lead exposure by assessing lead risks to children from all potential sources of lead exposure, allowing biomonitoring (blood testing) for all children under the age of five, and providing a response program for children who tested with high lead levels in their blood.[206]

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[194] 2003 ROD at 73.
[195] *Id.* at iii, 55.
[196] *Id.*
[197] *Id.*
[198] *Id.*
[199] *Id.* at 56.
[200] *Id.* at iii.
[201] *Id.* at 56.
[202] *Id.*
[203] *Id.* at 56–57.
[204] *Id.* at iii.
[205] *Id.* at 55.
[206] *Id.* at 54.

Last but not least, the ROD made three "statutory determinations" required under the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"). Among other things, EPA concluded that the "remedy is protective of human health and the environment," complies with state and federal laws, is cost effective, and utilizes permanent solutions to the maximum extent practical."[207]

d. 2004 Final Site Report

EPA sought assistance from the Army Corps of Engineers to execute the non-time-critical soil removal. The Army Corps and its contractor conducted the remediation at 133 priority properties between August and December of 2003, and an additional 33 properties between February and March of 2004.[208] A review of the Army Corp's 2004 Final Site Report reveals that it successfully executed the activities proposed in the 2003 Action Memorandum according to specifications at these properties.[209]

8. EPA Carries Out its Remediation Plan.

Since 2003, EPA has been working to fulfill the requirements of the Remedial Action Plan identified in the ROD.

a. Community Health Program

First, EPA established a Community Health Program to educate residents about soil pica behavior, and to evaluate the exposure posed to children in the neighborhood.[210] EPA hosted 38 clinics, which offered residents the opportunity for blood and urine testing. Twenty individuals were shown to have elevated blood levels of 10 mcg/dL lead, and 94 individuals had elevated blood concentrations of 5-10 mcg/dL.[211]

b. Soil Removal

EPA conducted most of the residential soil removals in 2004, 2005, and 2006.[212] In 2009, EPA conducted its first five-year review of the project, and found that some residents were not granting EPA access to their properties for remediation purposes.[213] Because "it was not cost effective" for EPA to continue to offer sampling of these 69 properties into the indefinite future,

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[207] *Id.* at 57.
[208] Project Resources, Inc. & U.S. Army Corps of Eng'rs Omaha Dist. Rapid Response Prg., *Final Site Report: Vasquez Boulevard/Interstate 70, Denver, Colorado* at 8 (Mar. 29, 2004) ("2004 Final Site Report") (Exhibit 39).
[209] *See id.* at 4–8, 17–18.
[210] 2003 ROD at iii.
[211] 2017 FRAR at 3-2.
[212] *Id.* at 3-3.
[213] 2014 ESD at 3–4.

EPA implemented new "informational" institutional controls.[214] EPA filed notices with the Denver Clerk and Recorder's office to inform potential buyers about the unremediated contamination.[215] EPA also began sending annual letters to each owner of record and each property address, to ensure that renters were informed.[216] In the end, EPA was unable to obtain owner permission to remediate 10 contaminated properties.[217]

EPA documented these changes to the remediation plan set out in the 2003 ROD in a five-page Explanation of Significant Differences ("ESD") that it released in 2014. EPA issued the ESD based on its authority under 40 C.F.R. §§ 300.435(c)(2)(i) & 300.825(a)(2), which allow the agency to modify a previously selected site remedy.[218] EPA explained that its inability to access numerous properties meant that "the remedy at OU1 was not protective of human health," which was why additional mechanisms of reaching property owners was necessary.[219] Accordingly, EPA chose to institute changes to the remediation plan designed to address the outstanding health risks by targeting specific property owners.[220]

c. Soil Testing

Surface-only sampling continued through approximately 2015.[221] In total, between the time that EPA issued the ROD in 2003 ROD and 2015, it tested approximately 382 properties, averaging 3 surface samples per property to determine contamination levels.[222] As a result of this sampling, EPA remediated 31 additional properties during this time.[223] EPA did not collect samples from 45 out of the 4,470 residential properties in OU1 because it was unable to obtain the property owners' permission.[224]

In 2017, EPA issued its Final Remedial Action Report. That report "document[ed] the remedial action completed at OU1" based on the OU1 ROD and the 2014 ESD."[225] Based on the Final Remedial Action Report concluding that all remedial action was complete, EPA initiated the proposed delisting of OU1 now at issue.[226]

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[214] *Id.* at 4
[215] *Id.*
[216] *Id.* at 4–5.
[217] 2017 FRAR at 1-2.
[218] 2014 ESD at 2.
[219] *Id.* at 3–4.
[220] *Id.* at 4.
[221] 84 Fed. Reg. at 2120.
[222] 2003 ROD at iii; 2017 FRAR at 3-2.
[223] 2017 FRAR at 3-2; *see also* CB&I Fed. Servs., LLC, *Final Institutional Control implementation and Assurance Plan: Vasquez Boulevard/Interstate 70 Operable Unit 1 – Residential Soils, Denver, Colorado, CERCLIS ID: CO0002259588* at 5 (Nov. 2016) ("2016 ICIAP") (Exhibit 40).
[224] 2017 FRAR at 1-2.
[225] *Id.* at 1-1.
[226] *See generally* 84 Fed. Reg. at 2120–21.

II. Legal Background

"Congress enacted CERCLA in 1980 to initiate and establish a comprehensive response and financing mechanism to abate and control the vast problems associated with abandoned and inactive hazardous waste disposal sites."[227] "CERCLA provides a comprehensive statutory scheme for cleaning up releases or threatened releases of hazardous substances."[228]

CERCLA requires EPA to list "national priorities among the known releases or threatened releases throughout the United States," and to designate, individually, a list of highest priority facilities that include those "presenting the greatest danger to public health or welfare or the environment."[229] "CERCLA . . . requires [EPA] to develop a national priority list, as part of the national contingency plan, which identifies 'priorities among releases or threatened releases throughout the United States,'" and listing a site on the NPL is a prerequisite to a Superfund-financed remedial action at the site.[230]

Factors EPA must consider when adding sites to the NPL include "relative risk or danger to public health or welfare or the environment," the "population at risk," the "hazard potential of the hazardous substances," and the "potential for direct human contact."[231] In 1986, Congress adopted aggressive timeframes to ensure that EPA was adding properties to the NPL expeditiously.[232] While NPL listing serves a primarily informational purpose, it spurs action by EPA to determine "which sites warrant further investigation to assess the nature and extent of the human health and environmental risks associated with a site," identifying when Superfund-financed remedial actions are needed, and notifying the public about contaminated sites.[233]

EPA adopted the close-to-modern version of its NPL regulations in 1990.[234] Today, the pertinent regulatory criteria for deleting sites from the NPL are listed in 40 C.F.R. § 300.425:

> Releases may be deleted from or recategorized on the NPL where no further response is appropriate.
>
> > (1) EPA shall consult with the state on proposed deletions from the NPL prior to developing the notice of intent to delete. In making a determination

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[227] *United States v. Colorado*, 990 F.2d 1565, 1570 (10th Cir. 1993) (quotation and citation omitted); *accord* Hazard Ranking System 55 Fed. Reg. 51,532, 51,532 (Dec. 14, 1990) (to be codified at 40 C.F.R. pt. 300) (providing a similar explanation of CERCLA's purpose).
[228] *Aztec Minerals Corp. v. EPA*, 198 F.3d 257, 1999 WL 969270, at *2 (10th Cir. Oct. 25, 1999).
[229] 42 U.S.C. § 9605(a)(8)(B).
[230] *United States v. Colorado*, 990 F.2d at 1570 (citations omitted) (quoting 42 U.S.C. § 9605(a)(8))
[231] 42 U.S.C. § 9605(a)(8)(A).
[232] *See id.* § 9616.
[233] EPA, *Basic NPL Information* (June 4, 2018) https://www.epa.gov/superfund/basic-npl-information (Exhibit 41).
[234] *See* 55 Fed. Reg. at 51,532.

to delete a release from the NPL, EPA shall consider, in consultation with the state, whether any of the following criteria has been met:

> (i) Responsible parties or other persons have implemented all appropriate response actions required;
>
> (ii) All appropriate Fund-financed response under CERCLA has been implemented, and no further response action by responsible parties is appropriate; or
>
> (iii) The remedial investigation has shown that the release poses no significant threat to public health or the environment and, therefore, taking of remedial measures is not appropriate.

(2) Releases shall not be deleted from the NPL until the state in which the release was located has concurred on the proposed deletion. EPA shall provide the state 30 working days for review of the deletion notice prior to its publication in the Federal Register.

(3) All releases deleted from the NPL are eligible for further Fund-financed remedial actions should future conditions warrant such action. Whenever there is a significant release from a site deleted from the NPL, the site shall be restored to the NPL without application of the HRS.[235]

EPA's delisting regulations also require the agency to take various steps to ensure public involvement in delisting decisions.[236] Among these requirements is that EPA must "[r]espond to each significant comment and any significant new data submitted during the comment period and include this response document in the final deletion package."[237]

EPA changed its deletion policy in 1995 to allow for "partial deletion."[238] EPA explained that it may delete sites from the NPL "when it determines that no further response is appropriate under [CERCLA]."[239] EPA explained that up until then, its policy had been to only delete sites after evaluating the entire site.[240] However, EPA realized that "[d]eletion of entire sites does not communicate the successful cleanup of portions of those sites," and that "[t]otal site cleanup may take many years, while portions of the site may have been cleaned up and may be available for productive use."[241] EPA thus elected to allow for partial deletion, while the remainder of a site remained on the NPL, with partial deletion subject to the same § 300.425(e)

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[235] 40 C.F.R. § 300.425(e).
[236] *See id.* § 300.425(e)(4).
[237] *Id.* § 300.425(e)(4)(iv).
[238] Notice of Policy Change: Partial Deletion of Sites Listed on the National Priorities List, 60 Fed. Reg. 55,466, 55,466 (Nov. 1, 1995).
[239] *Id.*
[240] *Id.*
[241] *Id.*

factors and state concurrence requirements as full deletions.[242] EPA emphasized that "[w]henever there is a significant release from a site or portion of a site deleted from the NPL, the site or portion may be restored to the NPL without application of the Hazard Ranking System."[243]

Indeed, this is required by statute. CERCLA's 1986 amendments provide that "[w]henever there has been . . . a significant release of hazardous substances or pollutants or contaminants from a site which is listed by the President as a 'Site Cleaned Up To Date' on the National Priorities List . . . the site shall be restored to the National Priorities List, without application of the hazard ranking system."[244]

III. Argument

EPA's proposal to delete VB/I-70 OU1 from the NPL is based on a flawed assumption that by completing the remediation activities identified in the 2003 ROD (as modified by the 2014 ESD), the agency has eliminated the health risks posed by lead and arsenic contamination in north Denver's residential soils. EPA may have accomplished what it set out to do in 2003, but the 2003 ROD relied on numerous erroneous assumptions. EPA has never conclusively identified the cause of the lead and arsenic contamination. Without knowing where the contaminants originated, EPA cannot definitely say that it has eliminated the health risks they pose, because it is possible for the contamination to recur. EPA has thus not met the requirements of 40 C.F.R. § 300.425(e), because it has not implemented all appropriate response actions, further response is appropriate, and significant health threats remain. EPA should therefore not finalize its proposed deletion of OU1. Instead, it should conduct further testing and investigation to determine the cause(s) of the contamination, and conduct additional remediation as appropriate to address any remaining health risks. In the alternative, if EPA finalizes the proposed deletion, it should conduct the same investigation, and, if warranted, designate a new OU4 and remediate that site as appropriate to address residual contamination.

EPA proposes to delete OU1 from the NPL because the 2003 ROD's remediation plan (as modified by the 2014 ESD) has been carried out.[245] EPA states that OU1 meets the 40 C.F.R. § 300.425(e) criteria for deletion because "the implemented remedies achieve the degree of cleanup and protection specified in the 2003 OU1 ROD and the 2014 ESD."[246] EPA has thus "determined that no further response is necessary at OU1."[247] EPA states that "the response activities at OU1 are complete," and that "the operable unit poses no unacceptable risk to human health."[248]

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[242] *Id.*
[243] *Id.* at 55,467.
[244] 42 U.S.C. § 9605(e).
[245] *See* 84 Fed. Reg. at 2120–21.
[246] *Id.* at 2121.
[247] *Id.*
[248] *Id.*

EPA's syllogistic logic may have intuitive appeal, but it rests on a faulty assumption: that the remedial actions identified in the 2003 ROD (as modified by the 2014 ESD) are actually sufficient to clean up north Denver's residential soils and eliminate unacceptable human health risks. Yet EPA has never actually determined what caused the lead and arsenic contamination in OU1's soil. EPA's hypotheses—atmospheric deposition from smelters and the use of arsenic-laced lawn-care products—are, by EPA's own admission, not consistent with the data. Extensive evidence, including from EPA's own sampling and analysis, shows that one likely cause of the contamination is the use of contaminated fill materials when north Denver's neighborhoods were initially built. EPA's systematic failure to require meaningful subsurface sampling—which resulted in the agency only replacing the top 12 inches of soil as part of its remediation plan—would not address this source of contamination. This is cause for concern because numerous mechanisms exist that would allow upward migration of the contaminants into the closer-to-surface soil. This would allow for recurring exposure, and health risk, to north Denver residents.

A. EPA Has Not Implemented All Appropriate Response Actions

EPA has not implemented all appropriate response actions because it has not determined the cause of the lead and arsenic contamination in OU1's residential soils. CERCLA's text, implementing regulations, and EPA's guidance use the term "appropriate response action" very broadly, to refer to any possible action EPA or a third party could take to investigate or remediate a contaminated site. EPA cannot say that it has implemented all appropriate response actions for OU1, because EPA has never definitely determined the cause of the lead and arsenic contamination in OU1's soil. Until EPA knows for certain what caused that contamination, it cannot definitely conclude that "all" appropriate response actions have been taken.

1. Legal Definition of an Appropriate Response Action

The first criteria for NPL delisting is that "[r]esponsible parties or other persons have implemented all appropriate response actions required." 40 C.F.R. § 300.425(e)(1)(i). CERCLA's text, EPA's regulations, and EPA guidance do not define an "appropriate response action." However, the term "response action" is used to refer to any action that EPA or another entity can potentially take to investigate or remediate contamination.

For example, the Tenth Circuit has used the term "appropriate response action" broadly to refer to any action that EPA could conceivably undertake to address contamination under CERCLA, consistent with the Act's intentionally broad scope and purpose.[249]

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[249] *See, e.g.*, *Aztec Minerals Corp.*, 198 F.3d 257, 1999 WL 969270, at *1–*2 (concluding that "appropriate response action" encompasses, among other things, allowing EPA to have unfettered access to a contaminated site, prohibiting entry by others absent EPA's written authorization, and barring any conveyance of an interest in the site absent 30 days' written notice to EPA); *United States v. Colorado*, 990 F.2d at 1583 (quoting H.R. Rep. No. 253(l), at 95 (1985)) (concluding that statutory interpretation that would limit a federal agency's ability to address hazardous substance releases from federal sites "by expeditious and appropriate response actions" would be contrary to CERCLA's legislative history).

Similarly, CERCLA's statutory definition section repeatedly references a "response action" as something that is subject to CERCLA's limitation on liability under § 9607(d).[250] Section 9607(d)(1), in turn broadly addresses "actions taken or omitted in the course of rendering care, assistance, or advice . . . with respect to an incident creating a danger to public health or welfare or the environment as a result of any releases of a hazardous substance or the threat thereof."[251] Other sections of CERCLA use the term "response action" to refer to any possible activity a person or entity can undertake as part of a remediation process that may ultimately fall within CERCLA's definition of a recoverable cost.[252]

EPA's 2011 guidance, Close Out Procedures for National Priority List Sites ("OSWER 9320.2-22"), which addresses NPL delisting, uses "response action" in a similarly broad way. For example, it states that "[a] Superfund site may require several response actions to address all the site hazards," which may include, among other actions, engineering controls, institutional controls, cleanup activities, investigatory studies, and feasibility studies.[253] The guidance also makes clear that EPA is not the sole arbiter of what constitutes an "appropriate response action[.]"[254]

EPA's guidance also explains that "site completion signifies the end of all response actions at a NPL site. The site completion designation generally means that the response actions at the site were completed and it is anticipated that no further Superfund response is necessary to protect human health and the environment."[255] This definition of site completion is important because EPA ties the deletion decision to site completion: "The NPL deletion process typically begins at most sites once it is determined that the site completion milestone has been achieved and documented."[256]

At bottom, then, an "appropriate response action" is very broadly defined to mean any potential investigative or remedial action that EPA can take to address contamination that is covered by Superfund. The use of the term "all" in 40 C.F.R. § 300.425(e)(1)(i) further underscores the intended breadth of the response actions that EPA must complete before delisting a site.[257] Indeed, EPA's guidance ties the propriety of a site's deletion from the NPL to the completion of a specific type of "response action"—meaning that "no further Superfund

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[250] *See, e.g.*, 42 U.S.C. § 9601(20)(F)(II)(ii), (G)(iv)(IX).
[251] *Id.* § 9607(d)(1).
[252] *See, e.g.*, *id.* § 9607(k)(6)(I)(2)(A), (r)(3)(A); *accord United States v. E.I. Dupont De Nemours & Co. Inc.*, 432 F.3d 161, 178–79 (3d Cir. 2005) (en banc); *Sanchez v. Esso Standard Oil de P.R., Inc.*, 747 F. Supp. 2d 261, 264–65 (D.P.R. 2010).
[253] EPA, Office of Superfund Remediation & Tech. Innovation, *Close Out Procedures for National Priorities List Sites,* OSWER Directive 9320.2-22 at 1-1 to 1-2 (May 2011), *available at* http://semspub.epa.gov/src/document/HQ/176076 ("OSWER 9320.2-22") (Exhibit 42).
[254] *See, e.g.*, *id.* at 3-9 (explaining that where a state is the lead agency at a site, EPA "relies heavily on the state to determine the appropriate response actions at a site").
[255] *Id.* at 4-1.
[256] *Id.* at 5-1.
[257] *See, e.g.*, *Ward v. Thomas*, 207 F.3d 114, 121 (2d Cir. 2000) ("'All' means every." (quotation and citation omitted)).

response is necessary to protect human health and the environment."[258] EPA therefore cannot certify that it has implemented "all appropriate response actions" until it has definitively determined that there are no additional response actions that it could take to protect human health and the environment from the exposure covered by a Superfund listing.

2. EPA Cannot Determine that It Has Taken all Appropriate Response Actions Without First Determining the Cause of OU1's Lead and Arsenic Contamination.

To be certain that all appropriate response actions have been taken to protect human health from the lead and arsenic contamination in north Denver's residential soils, EPA must, at the very least, know the cause of that contamination. Without knowing the cause of the contamination, the contamination could recur, which could pose threats to human health.

But by EPA's own admission, it does not know what caused the lead and arsenic contamination in OU1's soils. CDPHE initiated its 1997 sampling not because it knew of a specific contamination source, but rather to get to the bottom of Asarco's so-called "arsenic anomaly"—"random occurrences of elevated levels of arsenic in residential yards."[259] EPA's 1998 Phase I sampling was prompted by CDPHE's investigation. After Phase I sampling, EPA began expressing uncertainty about its atmospheric deposition hypothesis, stating that "[s]ources of contamination appear to be related primarily to historic smelting activities," and noting that atmospheric deposition from smelters only "may" have been the source of the contamination.[260] Even after Phase II sampling, "[a]t the time of the NPL listing proposal, EPA had little information about the possible source or sources of lead and arsenic in soil."[261] EPA concluded that the "data from Phase I and II" were "too limited to be the basis of remedial decisions."[262] By September 1999, EPA admitted that "atmospheric deposition of smelter emissions or importation of fill material from locations contaminated with smelter waste" could be the cause of the contamination.[263] EPA stated that there was "no discernable pattern for the extent of the metals contamination."[264]

EPA thus undertook Phase III sampling in order to "collect sufficient data to define the nature and extent of contamination."[265] But by 2001, EPA conceded that "[t]he arsenic anomaly in the greater Denver area has been studied intensely for the past decade. . . . Because of the site complexity . . . no one study has been able [to] scientifically determine the source(s) of the contamination."[266] By 2003, the agency was still at a loss to determine the source of contamination, and stated that "[t]he source of arsenic and lead in the soil of impacted residential

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[258] OSWER 9320.2-22 at 4-1.
[259] 2003 Information Package at 3.
[260] 1998 Action Memo at 1, 3 (emphasis added).
[261] 2003 Information Package at 6.
[262] *Id.* at 10.
[263] 1999 Soil Characterization Study at 1-2.
[264] 2001 FRIR at 3-5
[265] 2003 Information Package at 10.
[266] 2001 Soil Characterization Study at 13

properties in the VB/I-70 Site is not known."[267] The agency noted that another hypothesis it was "investigat[ing]" was the "placement of fill material from locations contaminated with waste from smelter operations at the Globe, Argo, and/or Omaha and Grant smelters."[268]

Thus, in 2003, the year when EPA issued the ROD, the agency was still uncertain about the cause of the elevated lead and arsenic in the OU1's residential soils. Though EPA claimed to be investigating whether fill material could be the cause the contamination, the agency had already debunked both hypotheses that it had actually tested—atmospheric deposition from smelters, and arsenic-laced lawncare products. EPA has repeatedly stated that its original theory, atmospheric deposition from smelters, is not borne out by the data. In its 2003 Information Package, the agency stated definitively that "the arsenic and lead in the residential soils of the VB/I-70 site could not be readily explained by emissions from the Asarco Globe Plant."[269]

EPA conducted additional investigation into Asarco's theory—that the arsenic originated in lawncare products—and its analysis confirmed what CDPHE had already concluded years earlier: that lawncare products could not be the entire cause of the arsenic anomaly.[270]

Atmospheric deposition and lawncare products may indeed be the cause of some of the lead and arsenic contamination in OU1's residential soils. But neither hypothesis, on its own or collectively, can explain the extent and random pattern of arsenic and lead contamination in OU1's residential soils. Since 2003, EPA has not yet conducted the necessary analysis to ascertain the actual cause (or more likely, causes) of the lead and arsenic contamination. Until EPA knows what caused the lead and arsenic contamination in the first place, it cannot determine whether all appropriate response actions have been taken, because the agency cannot know what those response actions might be.

B. Further Response by Responsible Parties Is Appropriate.

Gaps in EPA's investigations and remediation actions to date point to one obvious additional response action that the agency can, and must, take—a meaningful and extensive subsurface sampling program to investigate subsurface contamination. Because of EPA's initial focus on immediate threats to human health and the now disproven atmospheric deposition hypothesis, the agency's early sampling efforts largely ignored subsurface sampling. EPA's subsequent sampling and remediation efforts have continued to rely on, and replicate, that error. EPA has never undertaken meaningful or extensive subsurface sampling. As discussed below, and particularly because other hypotheses have been unable to explain the essentially random trends of lead and arsenic contamination in north Denver's soil, conducting additional subsurface sampling is undeniably an "appropriate further response action" that EPA must take prior to delisting OU1.

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[267] 2003 Action Memo at 3.
[268] *Id.*
[269] 2003 Information Package at 7.
[270] Norris Report at 22–23, 27–28; *accord* 2001 Soil Characterization Study at 13.

The second prong of § 300.425(e)'s delisting test is that "[a]ll appropriate Fund-financed response under CERCLA has been implemented, and no further response action by responsible parties is appropriate."[271] Here, "further response action" is appropriate, because subsurface sampling is a response action that evidence suggests will provide EPA with the information it needs to determine the cause of the lead and arsenic contamination in OU1's soil. This in turn will allow EPA to determine if any additional remediation is necessary to protect the health of north Denver residents.

In his Expert Report submitted as a comment on EPA's proposed OU1 delisting, Mr. Norris, a hydrologist with over 40 years of experience, explains why subsurface sampling is warranted.[272] Mr. Norris first explains the hydrology of north Denver, and that the area covered by OU1 roughly coincides with a natural alluvial floodplain.[273] He then explains the history the use of fill dirt to raise the elevation of north Denver properties located in the area to avoid intermittent flooding.[274] Mr. Norris highlights the evidence, including evidence gathered by CDOT's 1998 sampling program, which indicates that smelter waste (and other readily available potentially contaminated sources from the area's numerous industrial operations, such as tanneries and meatpacking plants) were used as fill dirt.[275] Mr. Norris explains that the haphazard use of smelter waste as fill dirt would be consistent with the random and otherwise inexplicable pattern of lead and arsenic contamination in north Denver's soils.[276] Finally, Mr. Norris explains the mechanism of upwards transport of contaminants in soil.[277] He concludes that EPA remediating only the top 12 inches of soil may not have prevented contamination from recurring in the future due to ongoing upwards transport mechanisms.[278]

Mr. Norris' report thus provides what EPA never has: a plausible, evidence-based hypothesis that would explain the apparently random pattern of lead and arsenic contamination in north Denver's soil. Investigating this hypothesis—and thereby determining an ongoing health risk may still potentially exist or recur—is clearly an "appropriate further response action."

This "further response action" is appropriate, and indeed necessary, because throughout the OU1's 20 year history, EPA has never conducted meaningful subsurface soil sampling.

Rather than conduct this sampling, the agency has repeatedly made incorrect statements about the potential for subsurface soil contamination, and overstated the extent of the subsurface contamination that it conducted. During Phase I sampling, EPA took a total of 2,363 surface (0 to 2 inch depth) samples and 1,096 subsurface (6 to 10 inch depth) soil samples from 1,152

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[271] 40 C.F.R. § 300.425(e)(1)(ii).
[272] Norris Report at 38, 42.
[273] *Id.* at 4–9.
[274] *Id.* at 9–11.
[275] *Id.* at 13–18, 24, 30–32.
[276] *Id.* at 23–26.
[277] *Id.* at 25–26.
[278] *Id.* at 26–29, 36–38.

residential properties.[279] EPA did not take a subsurface sample at every property.[280] Yet in later documents, EPA stated repeatedly that "[a] minimum" two surface and one subsurface sample were taken from each property during Phase I testing.[281]

When EPA tested the soils in sampled during Phase I, 15% of the highly-contaminated properties it found (7 out of 57) registered levels of lead and arsenic contamination above action levels in their subsurface samples. But EPA concluded that these seven properties "d[id] not pose an immediate threat and will be left for remedial action."[282] In other words, because the high levels of contamination were found six inches or more below the surface, and not at the surface, these properties were set aside and not designated for immediate soil removal.[283]

This decision effectively removed the properties with subsurface contamination from future analysis, because later sampling and analysis efforts were focused on properties that EPA had identified for time-critical removal. EPA's cursory analysis of the contamination found in the Phase I subsurface soils persisted as a justification for continuing to test only surface soil samples, from 1998 through to the present day.

During Phase II sampling, EPA collected additional samples from the 37 properties identified for time-critical removal during Phase I sampling—a subset of properties which only included properties with surface samples registering above the threshold (and excluded properties where subsurface samples revealed lead and arsenic levels above the relevant threshold).[284]

EPA's only other effort at gathering subsurface samples occurred during the Residential Risk Sampling. During that process, EPA took 36 soil profiles (measuring soil every two inches up to 12 inches in depth) from eight yards, including at least two profiles from each property, and up to nine at one property.[285] Five of the eight yards sampled were yards EPA had identified as having elevated surface, rather than subsurface, contamination in Phase I.[286] Thus, EPA conducted its second round of subsurface sampling at properties that it had already determined had high surface, but not high subsurface, contamination levels, inevitably skewing the results to show less evidence of subsurface contamination.

EPA did not conduct additional subsurface sampling during Phase III. However, during Phase III, EPA published its Rationale for only collecting surface samples. The Rationale states that EPA"[p]aired surface soil and depth samples were collected in three previous sampling programs: Phase I/II … and Risk-Based Sampling."[287] But this is misleading, because EPA did

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[279] 1998 Sampling Analysis Report at 2.
[280] *See supra* pp. 11–12 & n.61.
[281] *See, e.g.*, 2001 FRIR at 1-1.
[282] 1998 Action Memo at 2.
[283] *See id.*
[284] *See* 2003 Action Memo at 5.
[285] 2001 FRIR at 3-6; *see also* 1999 Rationale at 1; Norris Report at 17.
[286] *See* Norris Report at 17.
[287] 1999 Rationale at 1.

not pair every surface sample with a subsurface sample. Although the agency did take its subsurface samples from the same location of at least one surface sample, it took many surface samples without a corresponding subsurface sample.

EPA replicated this overstatement about the extent of its subsurface sampling program in numerous subsequent documents. Citing the Rationale, EPA stated that "[a]vailable data on lead and arsenic levels in residential soils were sufficient to establish that when contamination is present in a yard, it is mainly surficial (0-2 inches)."[288] In 2014, EPA stated, incorrectly that "[s]ince the contamination was only found in the top 3-6 inches, the EPA considered excavation to 12 inches to be adequate for removing all lead and arsenic contamination in the soils."[289]

To summarize, EPA only ever tested a very limited subset of properties in OU1 for subsurface lead and arsenic contamination. EPA's failure to test the subsurface at every property in OU1 is significant, because, by EPA's own admission, "[t]he lack of spatial pattern to the arsenic contamination indicated that essentially every property within the study area should be sampled since it would not be possible to predict levels in an individual yard by considering levels in yards within the vicinity."[290]

When EPA did conduct subsurface testing, it only did so to a depth of 12 inches (at a total of eight sites, five of which were known not to have subsurface contamination), and at six to ten inches at other properties. Even with this overly limited subsurface sampling program, EPA did find evidence of subsurface contamination. Fifteen percent of the contamination above dangerous levels that EPA identified during Phase I was in subsurface samples. This is consistent with CDOT's contemporaneous finding from a ten foot deep soil bore in the same area, which revealed "[e]levated concentrations of lead and arsenic," indicating, that "at least a portion of this fill is comprised of smelter waste from the former Omaha and Grant Smelter."[291] Lead levels in that sample were above 500 ppm, the action level in the 1993 Asarco Consent Decree.[292]

Given the extensive evidence described in Mr. Norris' report, from EPA's own overly-limited sampling program, and from CDOT's 1998 sampling, it is clear that meaningful and extensive subsurface soil sampling is an "appropriate further response action" that EPA must take before delisting OU1.

C. Significant Health Threats Remain.

The uncertainties surrounding the source of the contamination in OU1's soils, and EPA's failure to conduct meaningful and extensive subsurface sampling mean that the agency cannot say with confidence that no significant health threats remain. First, if contaminated fill dirt is indeed the source of the lead and arsenic in OU1's soils, then that contamination could recur due

[288] 2001 FRIR at 3-22.
[289] 2014 ESD at 3.
[290] 2003 Information Package at 10.
[291] 1998 I-70 Site Investigation at iv, 24
[292] *Id.* at 24.

to upward migration of the contaminants, and continue to pose a health threat. Second, EPA has limited the scope of its health analysis and sampling to focus exclusively on lead and arsenic, despite early evidence of problematic cadmium contamination, and evidence that many other pollutants in the area may also pose a threat to human health.

1. Upward Migration of Contaminants from Fill Dirt May Threaten Human Health in North Denver

EPA has never determined the cause of north Denver's soil contamination. One potential source may be upward migration of soil contamination from fill dirt, which could easily recur. Thus EPA cannot determine that its remediation efforts were successful and that there are "no significant threats to public health" until it conducts adequate subsurface sampling to determine whether upwards migration of contaminants from fill dirt pose a risk to human health.

The third and final criteria for deleting a site from the NPL is that "[t]he remedial investigation has shown that the release poses no significant threat to public health or the environment and, therefore, taking of remedial measures is not appropriate."[293] In EPA's 2001 Final Remedial Investigation Report, after extensive analysis of exposure pathways and the corresponding health risks, the agency concluded that in at least some of north Denver's yards, soil arsenic concentrations posed an unacceptably high cancer risk, and lead levels exceeded EPA's health based standards.[294]

In proposing to delete OU1 from the NPL, EPA "determined that the response activities at OU1 are complete and the operable unit poses no unacceptable risk to human health or the environment."[295] However, the conclusion that "no unacceptable risk to human health" remains does not follow from the premise that "response activities at OU1 are complete." That is because EPA has never determined the cause of elevated lead and arsenic levels in OU1's residential soils. One potential cause of soil contamination—upward migration of contaminants from fill dirt—can potentially cause contamination to recur. EPA therefore cannot say with confidence or accuracy that "no unacceptable risk to human health or the environment" remains.

As Mr. Norris explains, contaminants in soil can move in multiple directions. They can be transported more-or-less horizontally by groundwater flow, they can be transported downward by precipitation infiltration, and, most saliently here, they can migrate upwards through several mechanisms. These include physical diffusion (for gaseous contaminants), capillary action (wicking), botanical transport through uptake by plant roots, zoological transport (by burrowing reptiles, mammals, and insects), and anthropogenic activities (excavation and digging).[296] Mr. Norris explains that these transport mechanisms can potentially have moved the lead and arsenic (and potentially other) contaminants found in north Denver's soils upwards through layers of fill dirt.[297] He explains that this could lead to high concentrations in soils near the surface, where

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[293] 40 C.F.R. § 300.425(e)(1)(iii).
[294] FRIR at 5-16.
[295] 84 Fed. Reg. at 2121.
[296] Norris Report at 25–26.
[297] *Id.* at 26, 35–36.

there is greater potential for human exposure.[298] Mr. Norris therefore concludes that "[l]eaving the source(s) and transport mechanisms of the lead and arsenic intact will allow the shallow soil contamination by arsenic and lead to recur."[299]

As Mr. Norris explains, CDOT's 1998 sampling at the Brighton Boulevard interchange provides substantial evidence to support this hypothesis.[300] CDOT's boring uncovered "[e]levated concentrations of lead and arsenic" in fill material, and concluded that "at least a portion of this fill is comprised of smelter waste from the former Omaha and Grant Smelter."[301] CDOT also noted that "[e]xtensive areas of fill have been documented on the grounds of the Denver Coliseum," and that "the Coliseum was once the site of an extensive sand and gravel quarry which was subsequently filled with smelter slag and waste rock, and demolition debris from the Omaha and Grant Smelter."[302] Although the Coliseum area is mostly part of OU2, rather than OU1, it is within the exterior geographic boundaries of OU1. Given the extensive use of fill materials throughout the area, there is good reason to believe that adjacent areas of north Denver would have replicated the same pattern of using smelter wastes, coal ash, tannery waste, and other readily-available, potentially contaminated materials as fill dirt.

Moreover, CDOT is once again undergoing very extensive excavation and soil sampling activities as part of the Central 70 Project.[303] In addition to this extensive soil disturbance representing a potential anthropogenic pathway for bringing potentially contaminated soil to the surface, it also represents an opportunity for EPA to gain access to extensive data about subsurface soil conditions in north Denver.

2. EPA Must Consider Health Risks Posed Other Pollutants.

EPA also cannot determine that there are "no significant health risks" posed by residential soil contamination in OU1 because it has, to date, exclusively focused on lead and arsenic contamination. But EPA's own documents and other evidence demonstrate that many kinds of contaminants are present at alarmingly high levels within the OU1 area.

One major contaminant of concern is cadmium. EPA's early testing efforts focused on not only lead and arsenic, but also cadmium (and to a lesser extent, zinc).[304] The Regional Toxicologist's report, attached to the 1998 Action Memorandum, reveals that EPA also detected elevated cadmium levels, but "due to analytical difficulty," were not discussed.[305] Graphs included in the 2001 FRIR, representing results from the Residential Risk-Based Sampling Investigation, reveal that, of the eight properties sampled and tested for cadmium, five had

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[298] *Id.* at 26, 36–37.
[299] *Id.* at 37.
[300] *Id.* at 32.
[301] 1998 I-70 Site Investigation at 24, 40.
[302] *Id.* at 4.
[303] Norris Report at 32–33.
[304] *See, e.g.*, 2001 FRIR at ES-2, 3-1 to 3-2.
[305] 1998 Action Memo at 12

cadmium levels near, at, or above 20 ppm.[306] Specifically, two properties registered cadmium concentrations of 17 ppm, one 18 ppm, one 24 ppm, and one 30 ppm.[307] For reference, EPA has set a Toxicity Characteristic Listing Procedure ("TCLP") of 20 ppm for cadmium, meaning soil with cadmium levels above that threshold are considered to be hazardous waste.[308]

In EPA's June 1999 "Selection of Chemicals of Potential Health Concern" ("COPC"), the agency explains that cadmium and several other metals were eliminated from consideration because they did not reach the Risk-Based Concentrations established by EPA's Region 3.[309] It is unclear why EPA used Region 3's standards, and if those standards are, in fact, sufficient to protect human health given the distinct soil characteristics found in the arid climates of Region 8. The COPC relied on the data obtained during Phase I sampling and the Residential Risk-Based Sampling Investigation.[310] As discussed above, both these phases of sampling did not provide a complete picture of subsurface soil conditions. Additionally, the COPC report incorrectly states that the highest level of cadmium found was 19 ppm.[311] But the graphs from the 2001 FRIR reveal that two of the eight properties sampled in the Residential Risk-Based Sampling Investigation registered soil cadmium concentrations above 20 ppm, with one property registering cadmium levels as high as 30 ppm.[312]

EPA's COPC report also reveals that only metals were considered.[313] But in the same vicinity, CDOT's contemporaneous 1998 Brighton Boulevard interchange soil sampling uncovered a toxic soup of contaminants beyond lead and arsenic, consistent with the area's lengthy history of being home to a wide range of industrial activities.[314] Among other things, these contaminants include coal ash (leading to elevated silver levels), BTEX, semi-volatile organic compounds, perchloroethylene, diesel range hydrocarbons, chromium, and mercury.[315]

If either of EPA's hypotheses about the mechanism for soil contamination in north Denver were correct, and the elevated lead and arsenic in north Denver's soils in fact originated from atmospheric deposition or the application of lawn care products, then it would perhaps be reasonable to ignore these other contaminants. However, data shows that neither of these

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[306] 2001 FRIR at Appx. E3, pp. E3-1 to E3-8

[307] *Id.* at E3-1 to E3-5.

[308] *See, e.g.*, Geosyntec Consultants, *Engineering Evaluation/Cost Analysis: Sweetwater Marsh Unit Site, Operable Unit 1 (Burn Ash Areas), San Diego Bay National Wildlife Refuge, Chula Vist and National City, CA* at 9 & p. 159 (tbl. 3a) (Apr. 2017) (Exhibit 43).

[309] EPA, Selection of Chemicals of Potential Human Health Concern at the Vasquez Boulevard and I-70 Site at 2, 7 (1999) ("COPC") (Exhibit 45).

[310] *Id.* at 1

[311] *Id.* at 6–7.

[312] 2001 FRIR at Appendix E pp. E3-2, E3-5.

[313] *See generally* COPC at 1–2.

[314] 1998 I-70 Final Site Investigation at 24–30

[315] *Id.* at 24–28. Although petroleum and natural gas are excluded from the scope of materials covered by CERCLA, 42 U.S.C. § 9601(14), further investigation is necessary to determine whether the diesel range hydrocarbons originate from a source that falls within CERCLA's petroleum exclusion.

processes can fully explain the apparently random pattern of north Denver's soil contamination. Because upward migration of contaminants from fill dirt could explain the otherwise inexplicable results, and that fill dirt may be contaminated with a range of pollutants beyond lead and arsenic, EPA cannot determine that there are "no significant threats to public health" in north Denver until it has investigated whether soils are contaminated with pollutants other than lead and arsenic.

IV. In the Alternative, EPA Should Designate a New OU4 to Address the Remaining Soil Contamination that Threatens Public Health in North Denver.

For the reasons explained above, because EPA has not met 40 C.F.R. § 300.425(e)'s criteria, it should not delete OU1 from the NPL. However, if EPA nevertheless chooses to finalize the proposed action and delete OU1 from the NPL, that does not eliminate the agency's obligation to finish what it started in 1998 and fully remediate north Denver's soil. Although the Community Groups do not support delisting, they argue, in the alternative, that if EPA delists OU1, it should proceed expeditiously with adding a new OU4 to the NPL to address remaining unremediated soil contamination in north Denver.

CERCLA's text provides that delisting a site from the NPL is not a one way ratchet. CERCLA's 1985 amendments state that "[w]henever there has been . . . a significant release of hazardous substances or pollutants or contaminants from a site which is listed by the President as a 'Site Cleaned Up To Date' on the National Priorities List . . . the site shall be restored to the National Priorities List, without application of the hazard ranking system."[316] Consistent with this statutory directive, when EPA adopted regulations allowing for partial deletions in 1995, the agency emphasized that "[w]henever there is a significant release from a site or portion of a site deleted from the NPL, the site or portion may be restored to the NPL without application of the Hazard Ranking System."[317]

Further, EPA's guidance on delisting provides that "[d]eletion of a site or portion of a site from the NPL does not preclude eligibility for subsequent Fund-financed or responsible party actions. If future conditions warrant, the NCP (40 CFR 300.425(e)(3)) provides that Fund-financed remedial actions may be taken at sites or portions of sites deleted from the NPL. When there is a significant release from a site or portion of a site deleted from the NPL, the site or portion of a site may be restored to the NPL without rescoring the site under the HRS."[318]

Thus, EPA's decision to delist OU1 has no bearing on the agency's ability to conduct additional investigation into the causes of, or to remediate, soil contamination in north Denver. This is particularly true because EPA is proposing only a partial delisting—OU2 and OU3 will remain on the NPL until remediation activities there are complete.

There is ample evidence that additional contamination may exist that requires EPA's remediation efforts, and at the very least, that warrants additional investigation. As discussed

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[316] 42 U.S.C. § 9605(e).
[317] 84 Fed. Reg. at 55,467.
[318] OSWER 9320.2-22 at 5-1.

above, EPA has never meaningfully investigated subsurface soil contamination in north Denver—but evidence suggests that upward migration of contaminants may be the cause of the lead and arsenic contamination in OU1's residential soils.[319]

Additionally, OU1's boundaries were narrowly defined to include only residential properties. But north Denver is now, and has always been, an area with extensive industrial and commercial land uses, as well as an area with many public rights of way (highways, railroads, etc.). Given the random distribution of soil contaminants on residential properties, it stands to reason that many of these commercial, industrial, and public properties may also have contaminated soil. And those contaminants can easily migrate into adjacent residential properties.[320]

Finally, evidence suggests that lead and arsenic are probably not the only pollutants of concern in north Denver's soils. EPA should conduct more thorough sampling and testing for cadmium, and other contaminants that have been identified in CDOT's sampling.

Thus, if EPA chooses to delist OU1 (and even if it doesn't), it should immediately begin the process of carrying out a sampling program that investigates: (1) subsurface soil contamination on residential properties in OU1 to a meaningful depth multiple feet below the surface, (2) contamination in commercial properties, industrial properties, and public rights-of-way, and (3) contaminants beyond lead and arsenic. If that sampling and analysis reveals contamination that may pose a threat to human health, then EPA should create a new VB/I-70 OU4, and add that OU4 to the NPL to facilitate appropriate remediation activities.

EPA's guidance provides that "[w]hen there is a significant release from a site or portion of a site deleted from the NPL, the site or portion of a site may be restored to the NPL without rescoring the site under the HRS."[321] Therefore, EPA would not need to give the potential OU4 site an HRS score in order to add it to the NPL. Further, a hypothetical OU4 would likely meet the three criteria for determining NPL eligibility under 40 C.F.R. § 300.425(c)(3). First, the ATSDR has issued documented the health impacts of several pollutants of concern (including, for example, cadmium).[322] Second, EPA has already determined that elevated lead and arsenic exposures in OU1's residential soils pose significant threats to public health.[323] If those contaminants are migrating into residential soils from below, or from adjacent properties, then

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[319] *See supra* pp. 39–40.

[320] *See* Norris Report at 32.

[321] OSWER 9320.2-22 at 5-1.

[322] *See* ATSDR, *Toxicological Profile for Cadmium* at 11, 92, 196–97 (Sept. 2012), https://www.atsdr.cdc.gov/toxprofiles/tp5.pdf (Exhibit 46) (documenting health risks from soil-based exposure to cadmium); *see also* 40 C.F.R. § 300.425(c)(3)(i) (stating that a release may be included on the NPL if, among other things, "[t]he Agency for Toxic Substances and Disease Registry has issued a health advisory that recommends dissociation of individuals from the release").

[323] *See, e.g.*, 2001 FRIR at 5-16; 2003 Information Package at 21–43; *see also* 40 C.F.R. § 300.425(c)(3)(ii) (stating that a release may be included on the NPL, if among other things, "EPA determines that the release poses a significant threat to public health").

they would, by the same logic, also pose significant threats to public health. Finally, it would likely be more cost effective for EPA to use its remedial authority than to use its removal authority to respond to the contamination.[324] Notably, Alternative 6 (EPA's chosen remediation action in the 2003 ROD) was more cost effective than some less-protective alternatives, suggesting that remediation is a cost-effective option in the area.[325]

V. These Comments Are "Significant" and Constitute "Significant New Data."

EPA's delisting regulations require the agency to "[r]espond to each significant comment and any significant new data submitted during the comment period and include this response document in the final deletion package."[326]

These comments are "significant" because they present a comprehensive evaluation of the factual and legal basis for EPA's proposed delisting, and because they are signed by a range of community and environmental groups, as well as numerous individuals, who have participated extensively in the public aspects of the VB/I-70 Site. EPA therefore must respond to these comments and include this response in its final deletion package.[327]

Additionally, these comments represent "significant new data submitted during the comment period."[328] Specifically, (1) the analysis of CDOT's 1998 Brighton Boulevard subsurface soil sampling, (2) the analysis of Mr. Norris' expert report, and (3) CDOT's 2018 Soil Characterization Report for the Central 70 project (attached as Exhibit 44), all constitute significant new data. Mr. Norris' expert report, on its own, also qualifies as "significant new data." EPA has a regulatory obligation to consider each of these sources of significant new data, to respond to this new data, and to include that response in its final deletion package.[329]

The Community Groups welcome further conversation about their comments. You may contact them by telephone at 303-996-9628, or by email at jminor@earthjustice.org.

VI. Conclusion

Because EPA's remediation actions to date have not met the criterial outlined in 40 C.F.R. § 300.425(e), EPA should not finalize the proposed deletion of OU1. In the alternative, if EPA chooses to finalize the proposed deletion, then it should fully investigate potential residual contamination, including subsurface and deep soil samples from both residential and non-residential properties, and, if warranted, designate a new OU4 to remediate this contamination and eliminate remaining threats to human health.

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[324] *See* 40 C.F.R. § 300.425(c)(3)(iii) (stating that a release may be included on the NPL, if, among other things, "EPA anticipates that it will be more cost-effective to use its remedial authority than to use removal authority to respond to the release").
[325] *See* 2003 Information Package at p. 59 table 19 (comparing cost of each alternative).
[326] 40 C.F.R. § 300.425(e)(4)(iv).
[327] *See id.*
[328] *Id.*
[329] *See id.*

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Jorge Merida
Kimberly Morse, Administrator
Christine O'Connor, InterNeighborhood Cooperation representative
Armando Payan, United Community Action Network representative
Eileen (Bridget) Walsh, City Park Friends and Neighbors representative
VB/I-70 Community Advisory Group members (in their individual capacities)

Erika Delzell, Secretary, United Community Action Network
Janet Feder
Michele Swanson
Individuals

EXHIBIT INDEX

No.	Title	Abbreviation
1	Memo. from Jesse Avilés & Betsy Smidinger re: *Posting EPA-HQ-SFUND-1999-0010 to Regulations.gov for Public Access* (Feb. 13, 2019)	
2	Memorandum from Bonnie Lavelle, Remedial Project Manager, EPA Region VIII, to Max Dodson, Asst. Reg'l Adm'r, EPA Region VIII, re: *Request for a Non-Time Critical Removal Action at the Vasquez Boulevard/Interstate 70 Environmental Justice NPL Site, Denver County, Denver, Colorado* at 4 (Mar. 3, 2003)	2003 Action Memo
3	Denver City Council, *Elyria and Swansea Neighborhoods Plans* 14 (Feb. 23, 2015)	Elyria-Swansea Neighborhood Plan
4	Denver Post, *Gophertown Residents Live in the Abandoned Tunnles of Denver's Argo Smelter* (Aug. 17, 2012)	
5	Globeville Story, *Globe ASARCO* (May 23, 2011)	
6	Metz, Randel. Denver Public Library, *World's Tallest Smokestack Comes Tumbling Down* (Aug, 14, 2014)	
7	Globeville Story, *The Omaha and Grant Smelter* (May 3, 2011)	
8	Globeville Story, *Heritage of Smelting* (April 19, 2011)	
9	DeGette, Cara. Center for Health Journalism, *The Legacy of Pollution in One of Denver's Oldest Neighborhoods* (Feb. 19, 2013)	
10	Armijo & Hook, *How Neighborhood Planning Affects Health in Globeville & Elyria Swansea* 14 (Sept. 2014)	2014 HIA
11	Denver City Council, *Globeville Neighborhood Plan* 19 (Dec. 1, 2014)	Globeville Neighborhood Plan
12	City-Data.com, *Curtis Park neighborhood in Denver, Colorado (CO), 80205, 80216 detailed profile*. Last viewed April 5, 2019	
13	ClaytonDenver.org, *Welcome to Clayton!* Last viewed April 5, 2019.	
14	City-Data.com, *Clayton neighborhood in Denver, Colorado (CO), 80205 detailed profile*. Last viewed April 5, 2019	
15	LivingPlaces.com, *Cole Neighborhood Historic District*. Last viewed April 5, 2019.	
16	City-Data.com, *Cole neighborhood in Denver, Colorado (CO), 80205 detailed profile*. Last viewed April 5, 2019	

17	Svaldi, Aldo. The Denver Post, *Northeast Denver neighborhood is nation's most polluted* (Feb. 20, 2017)	
18	RealtyTrac, *17.3 Million U.S. Homes with Combined Value of $4.9 Trillion in Zip Codes with High Environmental Hazard Risk* (Feb. 16, 2017)	
19	Hubbard, Burt. The Colorado Trust, *In Denver's Older Neighborhoods, Kids Show Signs of Exposure to Lead* (Dec. 6, 2016)	
20	Colo. Pub. Radio, *Map: In Denver, Your Neighborhood Can Say A Lot About How Long You'll Live* (Dec. 2, 2015)	
21	Extreme Community Makeover, *The Neighborhood That Embodies Culture and Diversity*. Last viewed April 5, 2019.	
22	Black American West Museum & Heritage Center, *Visitor Information*. Last viewed April 5, 2019.	
23	Colo. Pub. Radio, *The Smithsonian is Preserving Denver's Black History, Starting With Family Photos* (Nov. 2, 2018)	
24	84 Fed. Reg. at 2118	
25	URS Operating Services, Inc. *Sampling Analysis Report for Removal Site Assessment, North Denver Residential Soils* (July 6, 1998)	1998 Sampling Analysis Report
26	Pete Stevenson, On-Scene Coordinator, Emergency Response Team, *Action Memorandum* (Sept. 16, 1998)	1998 Action Memo
27	CB&I Federal Services LLC, *Vasquez Boulevard/Interstate 70 Operable Unit 1 – Residential Soils, Denver, Colorado, Final Remedial Action Report*, (Feb., 2017)	2017 FRAR
28	Bonnie Lavelle, Remedial Project Manager, Environmental Protection Agency, Region VIII, *Vasquez Boulevard/ I-70 Superfund Site, Denver, Colorado, Information Package for the EPA National Remedy Review Board*, (Jan. 6, 2003)	2003 Info Package for EPA
29	Walsh Environmental Scientists and Engineers, Inc., *Final Site Investigation, I-70 Phase II and III Construction, 44th Street to Brighton Boulevard, City and County of Denver, Colorado*, (July 23, 1998)	1998 I-70 Site Invest.
30	David Mellard, PhD., Agency for Toxic Substances and Disease Registry. Letter to Ms. Bonnie Lavelle, US EPA Region VIII. (March 16, 1999)	1999 ATSDR Ltr
31	Washington Group International, *Final Remedial Investigation Report, VB/I-70 OU1*, (July 2001)	2001 FRIR
32	USEPA, Region 8, *Project Plan for the VB & I-70 Site, Pilot-Scale Soil Characterization Study*, (Sept. 9, 1999)	1999 Soil Characterization Report
33	US EPA. Region 8. Baseline Human Health Risk Assessment, Vasquez Boulevard and I-70 Superfund Site, Denver, CO. August, 2001.	2001 HRA

34	Univ. of Colo., Boulder CO, Dept. of Geological Scis., *Vasquez Boulevard and I-70 Site Pilot-Scale Soil Characterization Study: Mineral Phase Speciation and Bioaccessibility* at 13 (Nov. 1, 2001)	2001 Soil Characterization Study
35	VB-I/70 Superfund Site Community Advisory Group, *Resolution 2018-01* (Aug. 2018)	
36	EPA Region VIII, *Record of Decision: Vasquez Boulevard/Interstate 70 Superfund Site: Operable Unit 1 Residential Soils* at 1 (Sept. 25, 2003)	2003 ROD
37	Memo. from Mary Goldade, ISSI Consulting Grp., to Chris Weis & Bonnie Lavelle, re: *Phase 3 Investigation – Rationale for Collecting Surface Soil Samples Only* (June 18, 1999)	1999 Rationale
38	EPA Region VIII, *Explanation of Significant Differences: Operable Unit 1, Vasquez Boulevard/Interstate 70, City and County of Denver, Colorado* (Sept. 2014)	2014 ESD
39	Project Resources, Inc. & U.S. Army Corps of Eng'rs Omaha Dist. Rapid Response Prg., *Final Site Report: Vasquez Boulevard/Interstate 70, Denver, Colorado* at 8 (Mar. 29, 2004)	2004 Final Site Report
40	CB&I Fed. Servs., LLC, *Final Institutional Control Implementation and Assurance Plan: Vasquez Boulevard/Interstate 70 Operable Unit 1 – Residential Soils, Denver, Colorado, CERCLIS ID: CO0002259588* (Nov. 2016)	2016 ICIAP
41	EPA, *Basic Superfund Information*, (last updated June 4, 2018)	
42	EPA, Office of Superfund Remediation & Tech. Innovation, *Close Out Procedures for National Priorities List Sites,* OSWER Directive 9320.2-22 (May 2011)	
43	Geosyntec Consultants, *Engineering Evaluation/Cost Analysis Sweetwater Marsh Unit Site, Operable Unit 1 (Burn Ash Areas) San Diego Bay National Wildlife Refuge, Chula Vista and National City, CA* (April, 2017)	
44	Kiewit Meridiam Partners, *Central 70 Soil Characterization Results* (April 23 to Aug. 29, 2018)	2018 Soil Characterization Report
45	EPA, *Selection of Chemicals of Potential Human Health Concern at the Vasquez Boulevard and I-70 Site* (June 18, 1999)	COPC
46	U.S Department of Health and Human Services, Public Health Service, Agency for Toxic Substances and Disease Registry, *Toxicological Profile for Cadmium* (Sept., 2012)	